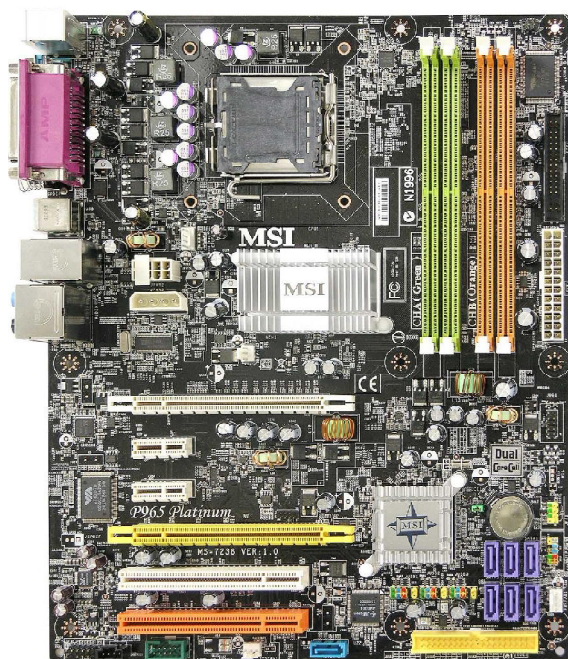


P965 Platinum Series

MS-7238 (V1.X) Mainboard



Copyright Notice

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Revision History

Revision	Revision History	Date
V1.0	First release	July 2006

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

- 🔍 Visit the MSI website for FAQ, technical guide, BIOS updates, driver updates, and other information: http://www.msi.com.tw/program/service/faq/faq/esc_faq_list.php

- 🔍 Contact our technical staff at: <http://support.msi.com.tw>

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. **DO NOT COVER THE OPENINGS.**
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by service personnel:
 - † The power cord or plug is damaged.
 - † Liquid has penetrated into the equipment.
 - † The equipment has been exposed to moisture.
 - † The equipment does not work well or you can not get it work according to User's Manual.
 - † The equipment has dropped and damaged.
 - † The equipment has obvious sign of breakage.
12. **DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60°C (140°F), IT MAY DAMAGE THE EQUIPMENT.**



CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.



警告使用者:

這是甲類的資訊產品，在居住的環境中使用時，可能會造成無線電干擾，在這種情況下，使用者會被要求採取某些適當的對策。



廢電池請回收

For better environmental protection, waste batteries should be collected separately for recycling or special disposal.

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part



N1996

15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the measures listed below.

- † Reorient or relocate the receiving antenna.
- † Increase the separation between the equipment and receiver.
- † Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- † Consult the dealer or an experienced radio/television technician for help.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LANOTICE D'INSTALLATIONAVANT DE RACCORDER AU RESEAU.



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and*
- (2) this device must accept any interference received, including interference that may cause undesired operation.*

WEEE (Waste Electrical and Electronic Equipment) Statement



ENGLISH

To protect the global environment and as an environmentalist, MSI must remind you that...

Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2002/96/EC, which takes effect on August 13, 2005, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life. MSI will comply with the product take back requirements at the end of life of MSI-branded products that are sold into the EU. You can return these products to local collection points.

DEUTSCH

Hinweis von MSI zur Erhaltung und Schutz unserer Umwelt

Gemäß der Richtlinie 2002/96/EG über Elektro- und Elektronik-Altgeräte dürfen Elektro- und Elektronik-Altgeräte nicht mehr als kommunale Abfälle entsorgt werden. MSI hat europaweit verschiedene Sammel- und Recyclingunternehmen beauftragt, die in die Europäische Union in Verkehr gebrachten Produkte, am Ende seines Lebenszyklus zurückzunehmen. Bitte entsorgen Sie dieses Produkt zum gegebenen Zeitpunkt ausschließlich an einer lokalen Altgerätesammelstelle in Ihrer Nähe.

FRANÇAIS

En tant qu'écologiste et afin de protéger l'environnement, MSI tient à rappeler ceci...

Au sujet de la directive européenne (EU) relative aux déchets des équipement électriques et électroniques, directive 2002/96/EC, prenant effet le 13 août 2005, que les produits électriques et électroniques ne peuvent être déposés dans les décharges ou tout simplement mis à la poubelle. Les fabricants de ces équipements seront obligés de récupérer certains produits en fin de vie. MSI prendra en compte cette exigence relative au retour des produits en fin de vie au sein de la communauté européenne. Par conséquent vous pouvez retourner localement ces matériels dans les points de collecte.

РУССКИЙ

Компания MSI предпринимает активные действия по защите окружающей среды, поэтому напоминаем вам, что...

В соответствии с директивой Европейского Союза (ЕС) по предотвращению загрязнения окружающей среды использованным электрическим и электронным оборудованием (директива WEEE 2002/96/EC), вступающей в силу 13 августа 2005 года, изделия, относящиеся к электрическому и электронному оборудованию, не могут рассматриваться как бытовой мусор, поэтому производители вышеперечисленного электронного оборудования обязаны принимать его для переработки по окончании срока службы. MSI обязуется соблюдать требования по приему продукции, проданной под маркой MSI на территории ЕС, в переработку по окончании срока службы. Вы можете вернуть эти изделия в специализированные пункты приема.

ESPAÑOL

MSI como empresa comprometida con la protección del medio ambiente, recomienda:

Bajo la directiva 2002/96/EC de la Unión Europea en materia de desechos y/o equipos electrónicos, con fecha de rigor desde el 13 de agosto de 2005, los productos clasificados como "eléctricos y equipos electrónicos" no pueden ser depositados en los contenedores habituales de su municipio, los fabricantes de equipos electrónicos, están obligados a hacerse cargo de dichos productos al termino de su período de vida. MSI estará comprometido con los términos de recogida de sus productos vendidos en la Unión Europea al final de su periodo de vida. Usted debe depositar estos productos en el punto limpio establecido por el ayuntamiento de su localidad o entregar a una empresa autorizada para la recogida de estos residuos.

NEDERLANDS

Om het milieu te beschermen, wil MSI u eraan herinneren dat....

De richtlijn van de Europese Unie (EU) met betrekking tot Vervuiling van Electrische en Electronische producten (2002/96/EC), die op 13 Augustus 2005 in zal gaan kunnen niet meer beschouwd worden als vervuiling.

Fabrikanten van dit soort producten worden verplicht om producten retour te nemen aan het eind van hun levenscyclus. MSI zal overeenkomstig de richtlijn handelen voor de producten die de merknaam MSI dragen en verkocht zijn in de EU. Deze goederen kunnen geretourneerd worden op lokale inzamelingspunten.

SRPSKI

Da bi zaštitili prirodnu sredinu, i kao preduzeće koje vodi računa o okolini i prirodnoj sredini, MSI mora da vas podesti da...

Po Direktivi Evropske unije ("EU") o odbačenju elektonskoj i električnoj opremi, Direktiva 2002/96/EC, koja stupa na snagu od 13. Avgusta 2005, proizvodi koji spadaju pod "elektronsku i električnu opremu" ne mogu više biti odbačeni kao običan otpad i proizvođači ove opreme biće prinudeni da uzmu natrag ove proizvode na kraju njihovog uobičajenog veka trajanja. MSI će poštovati zahtev o preuzimanju ovakvih proizvoda kojima je istekao vek trajanja, koji imaju MSI oznaku i koji su prodati u EU. Ove proizvode možete vratiti na lokalnim mestima za prikupljanje.

POLSKI

Aby chronić nasze środowisko naturalne oraz jako firma dbająca o ekologię, MSI przypomina, że...

Zgodnie z Dyrektywą Unii Europejskiej ("UE") dotyczącą odpadów produktów elektrycznych i elektronicznych (Dyrektywa 2002/96/EC), która wechodzi w życie 13 sierpnia 2005, tzw. "produkty oraz wyposażenie elektryczne i elektroniczne" nie mogą być traktowane jako śmieć komunalne, tak więc producenci tych produktów będą zobowiązani do odbierania ich w momencie gdy produkt jest wycofywany z użycia. MSI wypełni wymagania UE, przyjmując produkty (sprzedawane na terenie Unii Europejskiej) wycofywane z użycia. Produkty MSI będzie można zwracać w wyznaczonych punktach zbiorczych.

TÜRKÇE

Çevreci özelliğiyle bilinen MSI dünyada çevreyi korumak için hatırlatır:

Avrupa Birliği (AB) Kararnamesi Elektrik ve Elektronik Malzeme Atığı, 2002/96/EC Kararnamesi altında 13 Ağustos 2005 tarihinden itibaren geçerli olmak üzere, elektrikli ve elektronik malzemeler diğer atıklar gibi çöpe atılamayacak ve bu elektronik cihazların üreticileri, cihazların kullanım süreleri bittikten sonra ürünleri geri toplamakla yükümlü olacaktır. Avrupa Birliği'ne satılan MSI markalı ürünlerin kullanım süreleri bittiğinde MSI ürünlerin geri alınması isteği ile işbirliği içerisinde olacaktır. Ürünlerinizi yerel toplama noktalarına bırakabilirsiniz.

ČESKY

Záleží nám na ochraně životního prostředí - společnost MSI upozorňuje...

Podle směrnice Evropské unie ("EU") o likvidaci elektrických a elektronických výrobků 2002/96/EC platné od 13. srpna 2005 je zakázáno likvidovat "elektrické a elektronické výrobky" v běžném komunálním odpadu a výrobci elektronických výrobků, na které se tato směrnice vztahuje, budou povinni odebírat takové výrobky zpět po skončení jejich životnosti. Společnost MSI splní požadavky na odebrání výrobků značky MSI, prodávaných v zemích EU, po skončení jejich životnosti. Tyto výrobky můžete odevzdat v místních sběrnách.

MAGYAR

Annak érdekében, hogy környezetünket megvédjük, illetve környezetvédként fellépve az MSI emlékezteti Önt, hogy ...

Az Európai Unió („EU”) 2005. augusztus 13-án hatályba lépő, az elektromos és elektronikus berendezések hulladékairól szóló 2002/96/EK irányelve szerint az elektromos és elektronikus berendezések többé nem kezelhetők lakossági hulladékként, és az ilyen elektronikus berendezések gyártói kötelesek válnak az ilyen termékek visszavételére azok hasznos élettartama végén. Az MSI betartja a termékvisszavétellel kapcsolatos követelményeket az MSI márkánév alatt az EU-n belül értékesített termékek esetében, azok élettartamának végén. Az ilyen termékeket a legközelebbi gyűjtőhelyre viheti.

ITALIANO

Per proteggere l'ambiente, MSI, da sempre amica della natura, ti ricorda che....

In base alla Direttiva dell'Unione Europea (EU) sullo Smaltimento dei Materiali Elettrici ed Elettronici, Direttiva 2002/96/EC in vigore dal 13 Agosto 2005, prodotti appartenenti alla categoria dei Materiali Elettrici ed Elettronici non possono più essere eliminati come rifiuti municipali: i produttori di detti materiali saranno obbligati a ritirare ogni prodotto alla fine del suo ciclo di vita. MSI si adegnerà a tale Direttiva ritirando tutti i prodotti marchiati MSI che sono stati venduti all'interno dell'Unione Europea alla fine del loro ciclo di vita. È possibile portare i prodotti nel più vicino punto di raccolta.

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Chapter 1

Getting Started

Thank you for choosing the P965 Platinum Series (MS-7238 v1.X) ATX mainboard. The P965 Platinum Series mainboards are based on **Intel® P965 & ICH8R** chipsets for optimal system efficiency. Designed to fit the advanced **Intel® Pentium 4/ Pentium D/ Core 2 Duo** processor, the P965 Platinum Series deliver a high performance and professional desktop platform solution.

Mainboard Specifications

Processor Support*

- Intel® Pentium 4 and Pentium D processors in the LGA775 package.
- Supports Prescott, Cedar Mill, Smithfield, Presler, Core 2 Duo.

Supported FSB

- 1066/ 800/ 533 MHz

Chipset

- North Bridge: Intel® P965 chipset
- South Bridge: Intel® ICH8R chipset

Memory Support**

- DDRII 800/ 667/ 533 SDRAM
- 4 DDRII DIMMs (DDRII 800 supports up to 4 GB, DDRII 667/ 533 support up to 8 GB, 240pin / 1.8V)

LAN

- Supports 10/100/1000 PCI Express LAN by Realtek 8111B

IEEE 1394 (optional)

- Chip integrated by VIA VT6308 or VT6307
- Transfer rate is up to 400Mbps

Audio

- Chip integrated by Realtek® ALC883
- Flexible 8-channel audio with jack sensing
- Compliant with Azalia 1.0 Spec

IDE

- 1 IDE port by JMicron JMB361
- Supports Ultra DMA 66/100/133 mode
- Supports PIO, Bus Master operation mode

SATA

- 6 SATA II ports by ICH8R
- 1 SATA II port by JMicron JMB361
- Supports storage and data transfers at up to 300 MB/s

RAID

- SATA1~6 support RAID 0/ 1/ 10 or RAID 5 mode by ICH8R
- SATA7 and IDE1 support RAID 0/ 1 or JBOD mode by JMB361

Floppy

- 1 floppy port
- Supports 1 FDD with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes

Connectors

● Back panel

- 1 PS/2 mouse port
- 1 PS/2 keyboard port.
- 1 Serial port
- 1 Parallel port supporting SPP/EPP/ECP mode
- 1 IEEE 1394 port
- 4 USB 2.0 Ports.
- 1 LAN jack (10/100/1000) by Realtek 8111B
- 5 flexible audio jacks
- 1 Optical SPDIF jack / 1 Coaxial SPDIF-out port

● On-Board Pinheaders

- 1 D-Bracket™ 2 pinheader
- 1 IrDA pinheader
- 3 USB 2.0 pinheaders
- 1 SPDIF_Out pinheader

Slots

- 1 PCI Express x16 slot
- 1 PCI Express Lite slot (PCI_E4, it is compatible with PCI Express x 4 transfer rate)
- 2 PCI Express x1 slots (these 2 PCI Express x 1 slots are sharing with PCI_E4, and they will auto disable while card plugged into PCI_E4)
- 2 PCI slots, support 3.3V/ 5V PCI bus Interface, includes one orange slot which supports 2 master for MSI special PCI function card (ex. wireless LAN and bluetooth combo card.).

Form Factor

- ATX (30.5cm X 24.5cm)

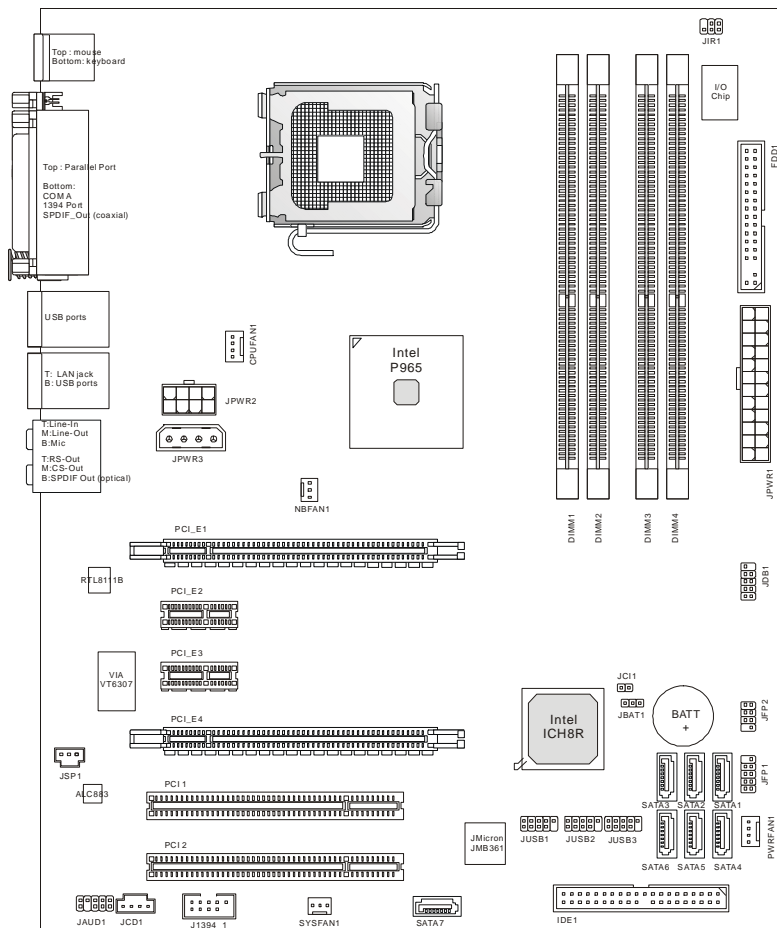
Mounting

- 9 mounting holes

* For the latest information about CPU, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_cpu_support.php

** For the updated supporting memory modules, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_trp_list.php

Mainboard Layout



P965 Platinum Series (MS-7238 v1.X) Mainboard

Packing Checklist



MSI motherboard



MSI Driver/Utility CD



SATA Cable (Optional)



Power Cable



Round Cable of
IDE Devices



D-Bracket 2
(Optional)



IEEE1394-Bracket
(Optional)



Back IO Shield



Round Cable of
Floppy Disk (Optional)



User's Guide

* The pictures are for reference only. Your packing contents may vary depending on the model you purchased.

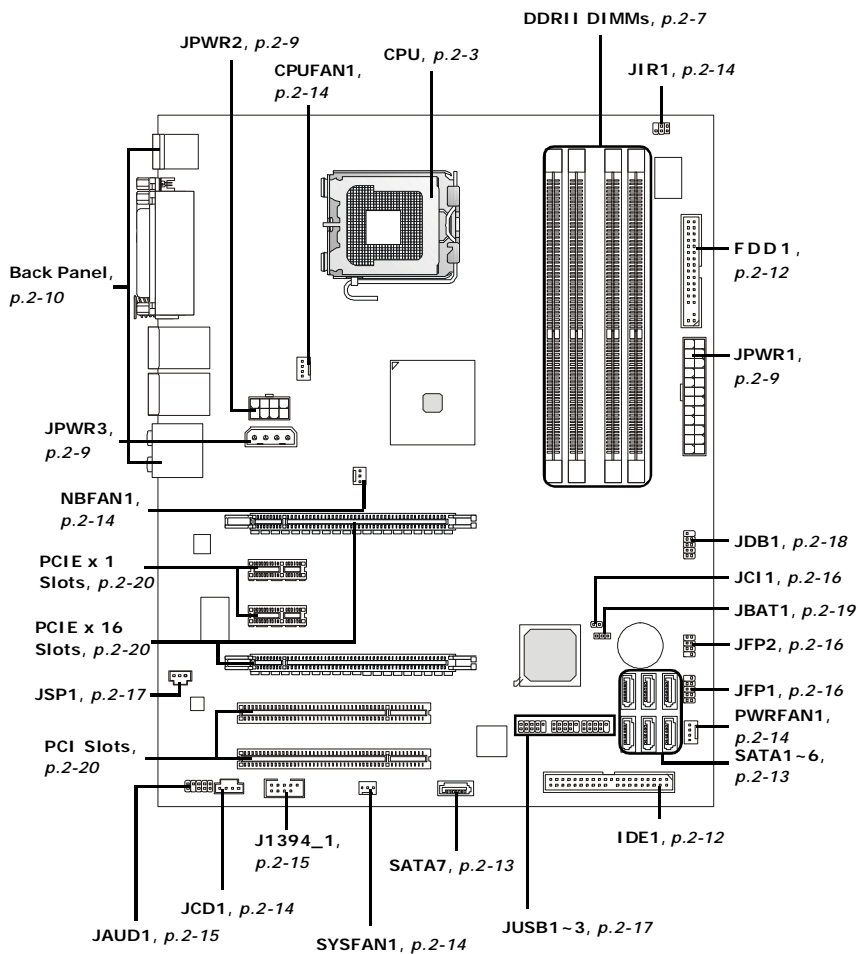
Chapter 2

Hardware Setup

This chapter provides you with the information about hardware setup procedures. While doing the installation, be careful in holding the components and follow the installation procedures. For some components, if you install in the wrong orientation, the components will not work properly.

Use a grounded wrist strap before handling computer components. Static electricity may damage the components.

Quick Components Guide



CPU (Central Processing Unit)

This mainboard supports Intel® Pentium 4 processor in LGA 775 package. When you are installing the CPU, **make sure to install the cooler to prevent overheating.** If you do not have the CPU cooler, contact your dealer to purchase and install them before turning on the computer.

For the latest information about CPU, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_cpu_support.php

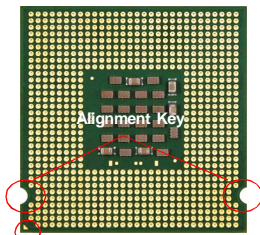


Important

1. Overheating will seriously damage the CPU and system. Always make sure the cooling fan can work properly to protect the CPU from overheating.
2. Make sure that you apply an even layer of heat sink paste (or thermal tape) between the CPU and the heatsink to enhance heat dissipation.
3. While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from the grounded outlet first to ensure the safety of CPU.

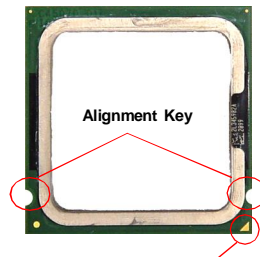
Introduction to LGA 775 CPU

The pin-pad side of LGA 775 CPU.



Yellow triangle is the Pin 1 indicator

The surface of LGA 775 CPU. Remember to apply some silicone heat transfer compound on it for better heat dispersion.



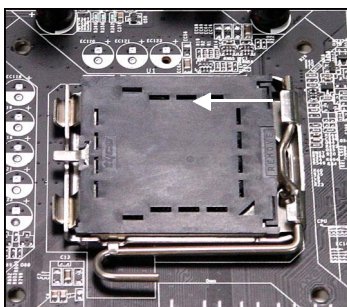
Yellow triangle is the Pin 1 indicator

CPU & Cooler Installation

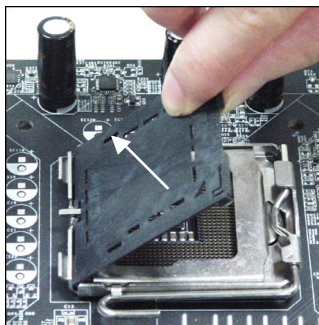
When you are installing the CPU, **make sure the CPU has a cooler attached on the top to prevent overheating.** If you do not have the cooler, contact your dealer to purchase and install them before turning on the computer. Meanwhile, do not forget to apply some silicon heat transfer compound on CPU before installing the heat sink/cooler fan for better heat dispersion.

Follow the steps below to install the CPU & cooler correctly. Wrong installation will cause the damage of your CPU & mainboard.

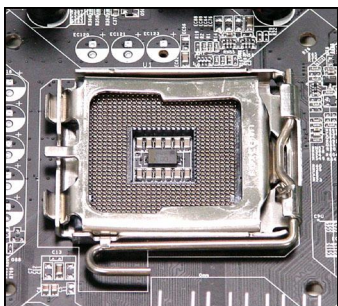
1. The CPU has a plastic cap on it to protect the contact from damage. Before you install the CPU, always cover it to protect the socket pin.



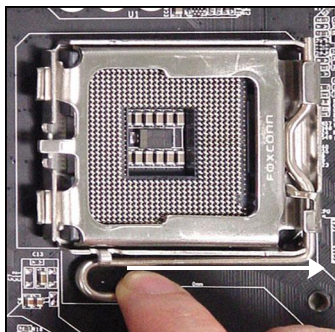
2. Remove the cap from lever hinge side (as the arrow shows).



3. The pins of socket reveal.



4. Open the load lever.

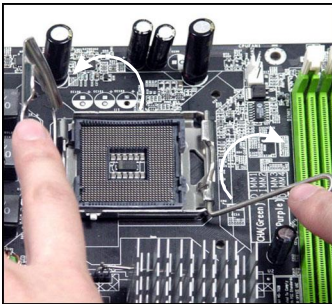




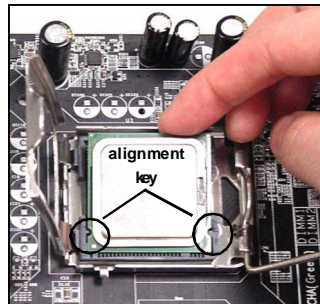
Important

1. Confirm if your CPU cooler is firmly installed before turning on your system.
2. Do not touch the CPU socket pins to avoid damaging.
3. The availability of the CPU land side cover depends on your CPU packing.

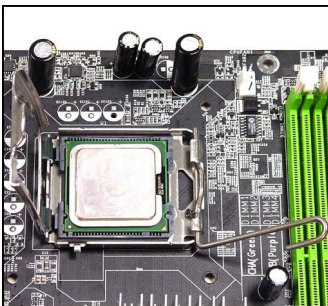
5. Lift the load lever up and open the load plate.



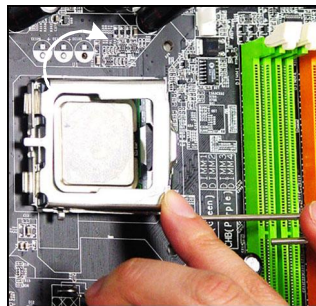
6. After confirming the CPU direction for correct mating, put down the CPU in the socket housing frame. Be sure to grasp on the edge of the CPU base. Note that the alignment keys are matched.



7. Visually inspect if the CPU is seated well into the socket. If not, take out the CPU with pure vertical motion and reinstall.

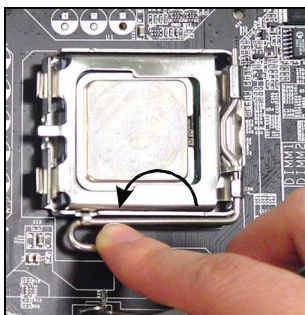


8. Cover the load plate onto the package.

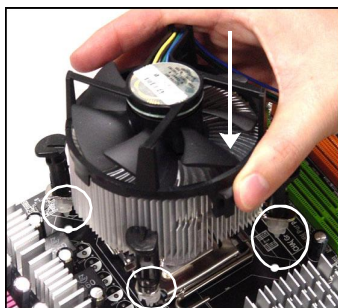


MS-7238 Mainboard

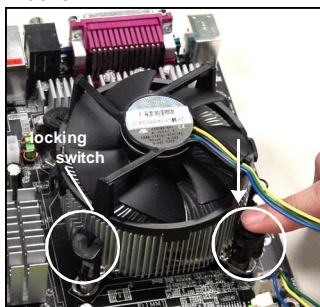
9. Press down the load lever lightly onto the load plate, and then secure the lever with the hook under retention tab.



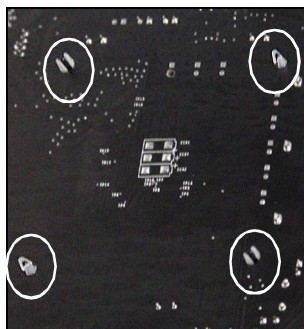
10. Align the holes on the mainboard with the heatsink. Push down the cooler until its four clips get wedged into the holes of the mainboard.



11. Press the four hooks down to fasten the cooler. Then rotate the locking switch (refer to the correct direction marked on it) to lock the hooks.



12. Turn over the mainboard to confirm that the clip-ends are correctly inserted.



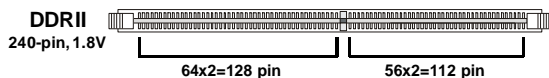
Important

1. Check the information in **H/W Monitor** of BIOS (Chapter 3) for the CPU temperature.
2. Whenever CPU is not installed, always protect your CPU socket pin with the plastic cap covered (shown in Figure 1) to avoid damaging.
3. Please note that the mating/unmating durability of the CPU is 20 cycles. Therefore we suggest you do not plug/unplug the CPU too often.

Memory

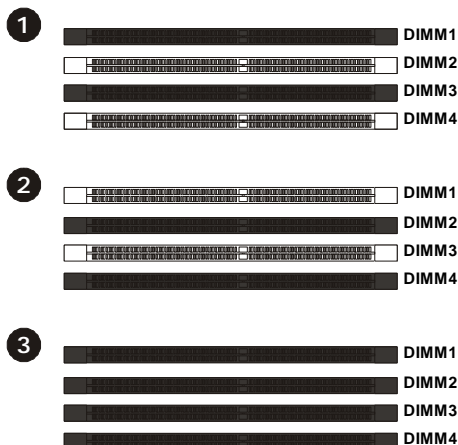
The mainboard provides four 240-pin non-ECC **DDRII 800/ 667/ 533** DIMM slots.

For more information on compatible components, please visit http://www.msi.com.tw/program/products/mainboard/mbd/pro_mbd_trp_list.php



Dual-Channel: Channel A in GREEN; Channel B in ORANGE

Dual Channel Memory Population Rules



Memory Speed/ CPU FSB Support Matrix

Memory CPU FSB	DDRII 533	DDRII 667	DDRII 800
533 MHz	OK		
800 MHz	OK	OK	OK
1066 MHz	OK	OK	OK

Installing DDRII Modules

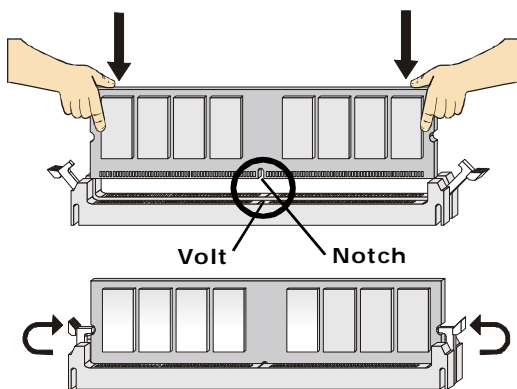
1. The memory module has only one notch on the center and will only fit in the right orientation.
2. Insert the memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the DIMM slot.



Important

You can barely see the golden finger if the module is properly inserted in the DIMM slot.

3. The plastic clip at each side of the DIMM slot will automatically close.



Important

- DDRII modules are not interchangeable with DDR and the DDRII standard is not backwards compatible. You should always install DDRII memory modules in the DDRII DIMM slots and DDR memory modules in the DDR DIMM slots.
- In dual-channel mode, make sure that you install memory modules of **the same type and density** in different channel DDR DIMM slots.
- To enable successful system boot-up, always insert the memory modules into the **DIMM1 first**.

Power Supply

ATX 24-Pin Power Connector: JPWR1

This connector allows you to connect an ATX 24-pin power supply. To connect the ATX 24-pin power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.

You may use the 20-pin ATX power supply as you like. If you'd like to use the 20-pin ATX power supply, please plug your power supply along with pin 1 & pin 13 (refer to the image at the right hand). There is also a foolproof design on pin 11, 12, 23 & 24 to avoid wrong installation.



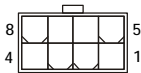
Pin Definition

Pin Definition			
PIN	SIGNAL	PIN	SIGNAL
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS-ON#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWROK	20	Res
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	NC	24	GND

ATX 12V Power Connector: JPWR2/ JPWR3

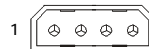
This 12V power connector JPWR2 is used to provide power to the CPU

This 12V power connector JPWR3 is used to provide power to stable the operation of graphics card.



JPWR2

PIN	SIGNAL	PIN	SIGNAL
1	GND	5	+12V
2	GND	6	+12V
3	GND	7	+12V
4	GND	8	+12V



JPWR3

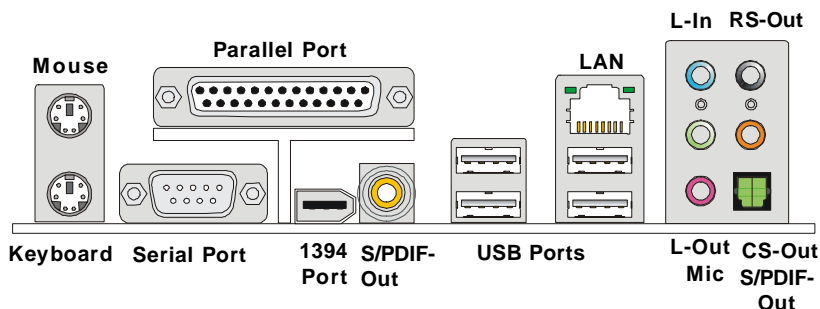
PIN	SIGNAL
1	5V
2	GND
3	GND
4	12V



Important

1. Make sure that all the connectors are connected to proper ATX power supplies to ensure stable operation of the mainboard.
2. Power supply of 450 watts (and above) is highly recommended for system stability.

Back Panel



► Mouse/Keyboard Connector

The standard PS/2® mouse/keyboard DIN connector is for a PS/2® mouse/keyboard.

► Parallel Port Connector

A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.

► Serial Port Connector

The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.

► Coaxial S/PDIF-Out connector

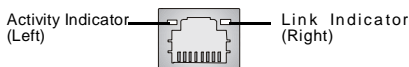
This SPDIF (Sony & Philips Digital Interconnect Format) connector is provided for digital audio transmission to external speakers through a coaxial cable.

► IEEE 1394 Port

The 1394 port on the back panel provides connection to 1394 devices.

► LAN (RJ-45) Jack

The standard RJ-45 jack is for connection to single Local Area Network (LAN). You can connect a network cable to it.



LED	Color	LED State	condition
Left	Orange	Off	LAN link is not established.
		On (steady state)	LAN link is established.
		On (blinking)	The computer is communicating with another computer on the LAN.
Right	Green	Off	10 Mbit/sec data rate is selected.
		On	100 Mbit/sec data rate is selected.
	Orange	On	1000 Mbit/sec data rate is selected.

► USB Connectors

The OHCI (Open Host Controller Interface) Universal Serial Bus root is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices.

► Audio Port Connectors

These audio connectors are used for audio devices. You can differentiate the color of the audio jacks for different audio sound effects.

- **Blue audio jack** - Line In, is used for external CD player, tapeplayer or other audio devices. Or Side-Surround Out in 7.1 channel mode
- **Green audio jack** - Line Out, is a connector for speakers or headphones.
- **Pink audio jack** - Mic In, is a connector for microphones.
- **Black audio jack** - Rear-Surround Out in 4-/ 5.1/ 7.1 channel mode.
- **Orange audio jack** - Center/ Subwoofer Out in 5.1/ 7.1 channel mode.

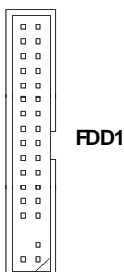
► Optical S/PDIF-Out connector

This SPDIF (Sony & Philips Digital Interconnect Format) connector is provided for digital audio transmission to external speakers through a fiber cable.

Connectors

Floppy Disk Drive Connector: FDD1

This standard FDD connector supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.



Hard Disk Connector: IDE1

The mainboard provides a one-channel Ultra ATA 133 bus Master IDE controller that supports PIO mode 0~4, Bus Master, and Ultra DMA 66/100/133 function. You can connect hard disk drives, CD-ROM drives and other IDE devices.



IDE1

IDE1

IDE can connect a Master and a Slave drive. You must configure the second hard drive to Slave mode by setting the jumper accordingly.

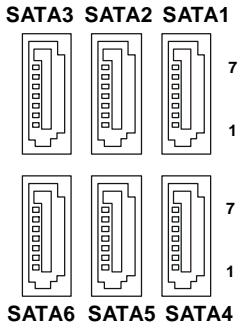


Important

If you install two hard disks on cable, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.

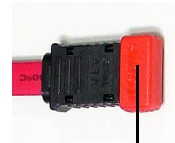
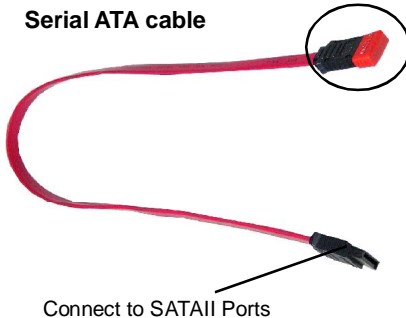
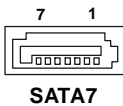
Serial ATA Connectors: SATA1~SATA7

SATA1~SATA7 are high-speed Serial ATAII interface ports. Each supports 2nd generation serial ATA data rates of 300MB/s and is fully compliant with Serial ATA 2.0 specifications. Each Serial ATAII connector can connect to 1 hard disk device.



SATA1 ~ SATA7 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	RXN
3	RXP	4	GND
5	TXN	6	TXP
7	GND		



Take out the dust cover and connect to the hard disk devices

Connect to SATAII Ports

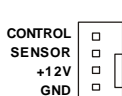


Important

Please do not fold the Serial ATA cable into 90-degree angle. Otherwise, data loss may occur during transmission.

Fan Power Connectors: CPUFAN1, SYSFAN1, NBFAN1 & PWRFAN1

The fan power connectors support system cooling fan with +12V. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU/ NB/ SYS fan control.



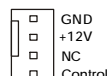
CPUFAN1



SYSFAN1



NBFAN1



PWRFAN1



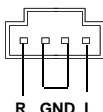
Important

1. Please refer to the recommended CPU fans at Intel® official website or consult the vendors for proper CPU cooling fan.

CD-In Connector: JCD1

This connector is provided for CD-ROM audio.

JCD1



IrDA Infrared Module Header: JIR1

The connector allows you to connect to IrDA Infrared module. You must configure the setting through the BIOS setup to use the IR function. JIR1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.



Pin Definition

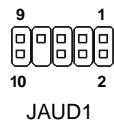
Pin	Signal
1	IRRX
2	IRTX
3	GND
4	VCC5
5	Key (no pin)
6	NC

Front Panel Audio Connector: JAUD1

The JAUD1 front panel audio connector allows you to connect the front panel audio and is compliant with Intel® Front Panel I/O Connectivity Design Guide.

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	PORT 1L	Analog Port 1 - Left channel
2	GND	Ground
3	PORT 1R	Analog Port 1 - Right channel
4	PRESENCE#	Active low signal - signals BIOS that a High Definition Audio dongle is connected to the analog header. PRESENCE# = 0 when a High Definition Audio dongle is connected.
5	PORT 2R	Analog Port 2 - Right channel
6	SENSE1_RETURN	Jack detection return from front panel JACK1
7	SENSE_SEND	Jack detection sense line from the High Definition Audio CODEC jack detection resistor network
8	KEY	ConnectorKey
9	PORT 2L	Analog Port 2 - Left channel
10	SENSE2_RETURN	Jack detection return from front panel JACK2

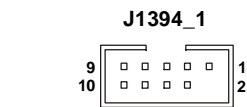


IEEE 1394 Connectors: J1394_1 (Optional)

The mainboard provides IEEE1394 pinheader that allows you to connect IEEE 1394 ports via an external IEEE1394 bracket (optional).

Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	Ground	2	Key (no pin)
3	Cable power	4	Cable power
5	TPB-	6	TPB+
7	Ground	8	Ground
9	TPA-	10	TPA+



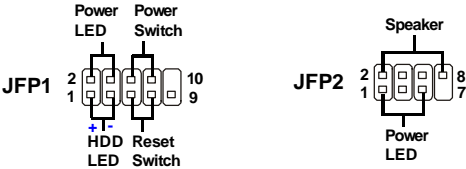
Connected to 1394 connector



IEEE1394 Bracket (Optional)

Front Panel Connectors: JFP1/JFP2

The mainboard provides two front panel connectors for electrical connection to the front panel switches and LEDs. The JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.



JFP1 Pin Definition

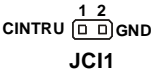
PIN	SIGNAL	DESCRIPTION
1	HD_LED +	Hard disk LED +
2	PWR/SLP LED	Power LED+ / Suspend LED
3	HD_LED -	Hard disk LED-
4	PWR/SLP LED	Power LED- / Suspend LED
5	RST_SW	Reset Switch
6	PWR_SW	Power Switch
7	RST_SW	Reset Switch
8	PWR_SW	Power Switch
9	N.C.	Not Connected
10	Key	Key (no pin)

JFP2 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	GND	Ground (LED-)
2	SPK	Speaker
3	SLP LED	Suspend LED+
4	BUZ	Buzzer
5	PWR LED	Power LED+
6	BUZ	Buzzer
7	Key	Key (no pin)
8	SPK	Speaker

Chassis Intrusion Switch Connector: JCI1

This connector connects to a 2-pin chassis switch. If the chassis is opened, the switch will be short. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS Setup and clear the record.

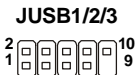


Front USB Connectors: JUSB1, JUSB2, JUSB3

The mainboard provides USB 2.0 pinheaders (optional USB 2.0 bracket available) that are compliant with Intel® I/O Connectivity Design Guide. USB 2.0 technology increases data transfer rate up to a maximum throughput of 480Mbps, which is 40 times faster than USB 1.1, and is ideal for connecting high-speed USB interface peripherals such as **USB HDD, digital cameras, MP3 players, printers, modems and the like.**

Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key (no pin)	10	N.C.



USB 2.0 Bracket
(Optional)

Connected to USB connector

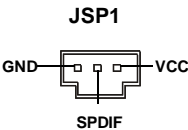


Important

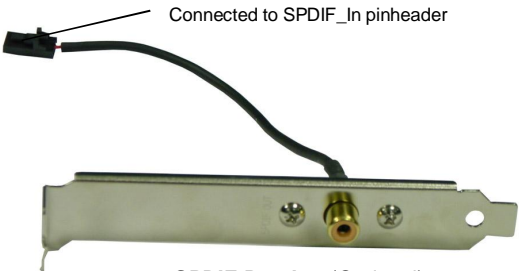
Note that the pins of VCC and GND must be connected correctly to avoid possible damage.

SPDIF-Out Connector: JSP1 (Optional)

This connector is used to connect SPDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission.



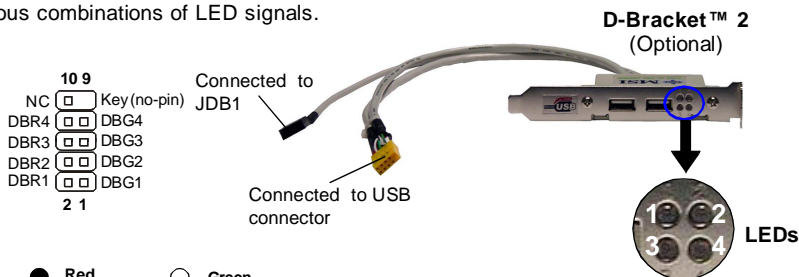
Connected to SPDIF_In pinheader



SPDIF Bracket (Optional)

D-Bracket™ 2 Connector: JDB1

The mainboard comes with a JDB1 connector for you to connect to D-Bracket™ 2. D-Bracket™ 2 is an external USB Bracket that supports both USB1.1 & 2.0 specs. It integrates four LEDs and allows users to identify system problems through 16 various combinations of LED signals.



LED Signal	Description	LED Signal	Description
1 ● 2 ● 3 ● 4 ●	System Power ON The D-LED will hang here if the processor is damaged or not installed properly.	1 ● 2 ● 3 ○ 4 ○	Initializing Video Interface This will start detecting CPU clock, checking type of video onboard. Then, detect and initialize the video adapter.
1 ○ 2 ● 3 ● 4 ●	Early Chipset Initialization	1 ○ 2 ● 3 ● 4 ●	BIOS Sign On This will start showing information about logo, processor brand name, etc...
1 ○ 2 ○ 3 ● 4 ●	Memory Detection Test Testing onboard memory size. The D-LED will hang if the memory module is damaged or not installed properly.	1 ● 2 ● 3 ● 4 ○	Testing Base and Extended Memory Testing base memory from 240K to 640K and extended memory above 1MB using various patterns.
1 ○ 2 ○ 3 ● 4 ●	Decompressing BIOS image to RAM for fast booting.	1 ○ 2 ○ 3 ● 4 ●	Assign Resources to all ISA.
1 ● 2 ● 3 ○ 4 ○	Initializing Keyboard Controller.	1 ● 2 ● 3 ○ 4 ○	Initializing Hard Drive Controller This will initialize IDE drive and controller.
1 ○ 2 ● 3 ○ 4 ○	Testing VGA BIOS This will start writing VGA sign-on message to the screen.	1 ○ 2 ● 3 ○ 4 ○	Initializing Floppy Drive Controller This will initialize Floppy Drive and controller.
1 ● 2 ● 3 ● 4 ●	Processor Initialization This will show information regarding the processor (like brand name, system bus, etc...)	1 ● 2 ● 3 ○ 4 ○	Boot Attempt This will set low stack and boot via INT 19h.
1 ○ 2 ○ 3 ○ 4 ●	Testing RTC (Real Time Clock)	1 ○ 2 ○ 3 ○ 4 ○	Operating System Booting

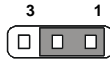
Jumpers

Clear CMOS Jumper: JBAT1

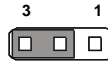
There is a CMOS RAM onboard that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, set the JBAT1 (Clear CMOS Jumper) to clear data.



JBAT1



Keep Data



Clear Data



Important

You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

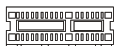
Slots

PCI (Peripheral Component Interconnect) Express Slots

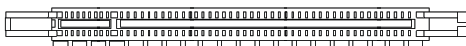
PCI Express architecture provides a high performance I/O infrastructure for Desktop Platforms with transfer rates starting at 2.5 Giga transfers per second over a PCI Express x1 lane for Gigabit Ethernet, TV Tuners, 1394 controllers, and general purpose I/O. Also, desktop platforms with PCI Express Architecture will be designed to deliver highest performance in video, graphics, multimedia and other sophisticated applications. Moreover, PCI Express architecture provides a high performance graphics infrastructure for Desktop Platforms doubling the capability of existing AGP 8x designs with transfer rates of 4.0 GB/s over a PCI Express x16 lane for graphics controllers, while PCI Express x1 supports transfer rate of 250 MB/s.



**PCI Express x16 Slot
(White)**



PCI Express x1 Slot



**PCI Express Lite Slot
(Yellow, supports PCIe X 4
transfer rate)**

PCI (Peripheral Component Interconnect) Slots

The PCI slots support LAN cards, SCSI cards, USB cards, and other add-on cards that comply with PCI specifications. At 32 bits and 33 MHz, it yields a throughput rate of 133 MBps.



32-bit PCI Slot



Important

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

If you have a PCIe x16 graphics card, please always install it into the PCI Express x16 (white/ PCI_E1) slot to ensure the performance of graphics card.

PCI Interrupt Request Routing

The IRQ, acronym of interrupt request line and pronounced I-R-Q, are hardware lines over which devices can send interrupt signals to the microprocessor. The PCI IRQ pins are typically connected to the PCI bus pins as follows:

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT A#	INT B#	INT C#	INT D#
PCI Slot 2	INT B#	INT C#	INT D#	INT A#

Chapter 3

BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

You may need to run the Setup program when:

- ≈ An error message appears on the screen during the system booting up, and requests you to run SETUP.
- ≈ You want to change the default settings for customized features.

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press key to enter Setup.

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.



Important

1. The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.
2. Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format:

A7238IMS V1.0 070706 where:

1st digit refers to BIOS maker as A = AMI, W = AWARD, and P = PHOENIX.

2nd - 5th digit refers to the model number.

6th digit refers to the chipset as I = Intel, N = nVidia, and V = VIA.

7th - 8th digit refers to the customer as MS = all standard customers.

V1.0 refers to the BIOS version.

070706 refers to the date this BIOS was released.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General Help
<F6>	Load Optimized Defaults
<F10>	Save all the CMOS changes and exit

Getting Help

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑ ↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑ ↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc>.

▶ IDE Primary Master
▶ IDE Primary Slave
▶ IDE Secondary Master
▶ IDE Secondary Slave

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

The Main Menu



► Standard CMOS Features

Use this menu for basic system configurations, such as time, date etc.

► Advanced BIOS Features

Use this menu to setup the items of AMI® special enhanced features.

► Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance.

► Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

► Power Management Features

Use this menu to specify your settings for power management.

► PNP/PCI Configurations

This entry appears if your system supports PnP/PCI.

► H/W Monitor

This entry shows your PC health status.

► Cell Menu

Use this menu to specify your settings for frequency/voltage control and overclocking.

► **Load Optimized Defaults**

Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

► **BIOS Setting Password**

Use this menu to set the password for BIOS.

► **Save & Exit Setup**

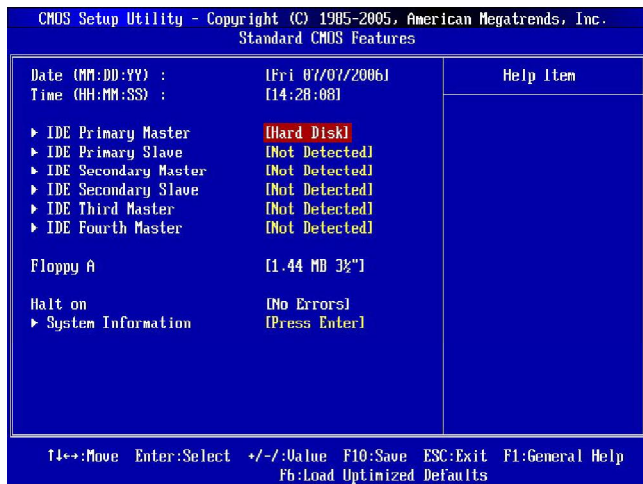
Save changes to CMOS and exit setup.

► **Exit Without Saving**

Abandon all changes and exit setup.

Standard CMOS Features

The items in Standard CMOS Features Menu includes some basic setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.



► Date (MM:DD:YY)

This allows you to set the system to the date that you want (usually the current date). The format is <day><month> <date> <year>.

day	Day of the week, from Sun to Sat, determined by BIOS. Read-only.
month	The month from Jan. through Dec.
date	The date from 1 to 31 can be keyed by numeric function keys.
year	The year can be adjusted by users.

► Time (HH:MM:SS)

This allows you to set the system time that you want (usually the current time). The time format is <hour> <minute> <second>.

► IDE Primary/Secondary Master/ Slave, IDE Third/ Fourth Master

Press <Enter> to enter the sub-menu, and the following screen appears.



► Device/ Vender/ Size

It will showing the device information that you connected to the IDE/SATA connector .

► LBA/Large Mode

This allows you to enable or disable the LBA Mode. Setting to Auto enables LBA mode if the device supports it and the devices is not already formatted with LBA mode disabled.

► DMA Mode

Select DMA Mode.

► Hard Disk S.M.A.R.T.

This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.



Important

IDE Primary/Secondary Master/ Slave, IDE Third/ Fourth Master are appearing when you connect the HD devices to the SATA connector on the mainboard.

► Floppy Drive A

This item allows you to set the type of floppy drives installed. Available options: [None], [360K, 5.25 in.], [1.2M, 5.25 in.], [720K, 3.5 in.], [1.44M, 3.5 in.], [2.88M, 3.5 in.].

► Halt On

The setting determines whether the system will stop if an error is detected at boot. Available options are:

[No Errors]	The system doesn't stop for any detected error.
[All, But Keyboard]	The system doesn't stop for a keyboard error.

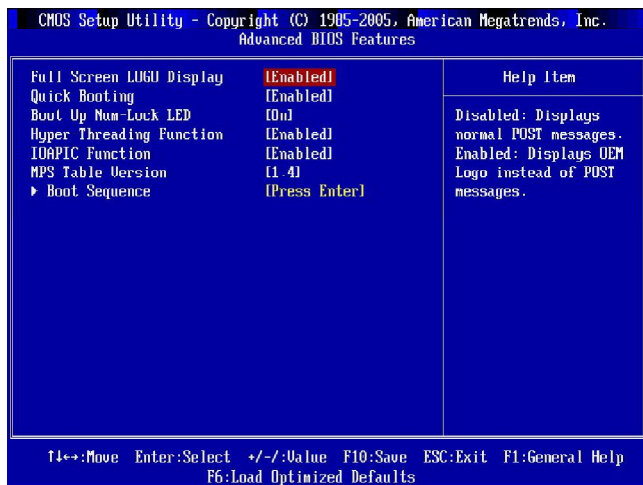
► System Information

Press <Enter> to enter the sub-menu, and the following screen appears.

CMOS Setup Utility - Copyright (C) 1995-2005, American Megatrends, Inc.		
System Information		
Total System Memory	1024MB	Help Item
BIOS Version	V1.0B5	
** CPU Information **		
<hr/>		
Intel(R) Pentium(R) 4 CPU 3.00GHz		
CPU ID/uCode ID	0F62h/0Fh	
CPU Frequency	3.00GHz (200x15)	

This sub-menu shows the CPU information, BIOS version and memory status of your system (read only).

Advanced BIOS Features



► Full Screen LOGO Display

This item enables you to show the company logo on the bootup screen. Settings are:

- [Enabled] Shows a still image (logo) on the full screen at boot.
- [Disabled] Shows the POST messages at boot.

► Quick Booting

Setting the item to [Enabled] allows the system to boot within 10 seconds since it will skip some check items.

► Boot Up Num-Lock LED

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

► Hyper-Threading Function

The processor uses Hyper-Threading technology to increase transaction rates and reduces end-user response times. The technology treats the two cores inside the processor as two logical processors that can execute instructions simultaneously. In this way, the system performance is highly improved. If you disable the function, the processor will use only one core to execute the instructions. **Please disable this item if your operating system doesn't support HT Function, or unreliability and instability may occur.**



Important

Enabling the functionality of Hyper-Threading Technology for your computer system requires ALL of the following platform Components:

- * **CPU:** An Intel® Pentium® 4 Processor with HT Technology;
- * **Chipset:** An Intel® Chipset that supports HT Technology;
- * **BIOS:** A BIOS that supports HT Technology and has it enabled;
- * **OS:** An operating system that supports HT Technology.

*For more information on Hyper-threading Technology, go to:
www.intel.com/info/hyperthreading*

► IOAPIC Function

This field is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance with PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQ resources for the system.

► MPS Table Version

This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system.

► Boot Sequence

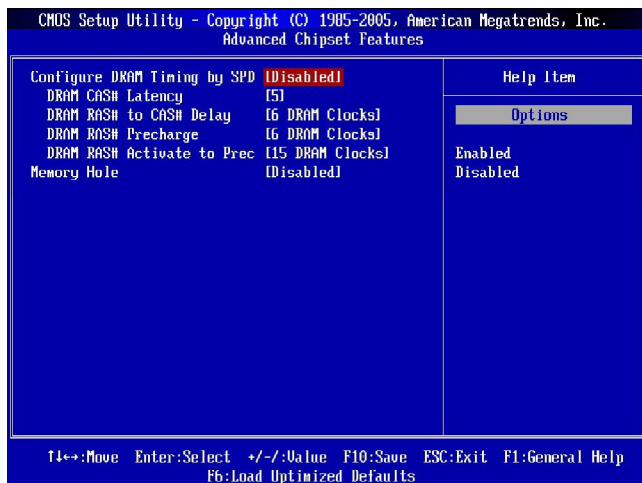
Press <Enter> to enter the sub-menu and the following screen appears:

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.		
Boot Sequence		
1st Boot Device	[1st FLOPPY DRIVE]	Help Item
2nd Boot Device	[SATA:PM-ST:3120813A]	Specifies the boot
3rd Boot Device	[Network:Realtek Bo]	

► 1st/2nd/3rd Boot Device

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system.

Advanced Chipset Features



► Configure DRAM Timing by SPD

The system board designer must select the proper value for this field, according to the specifications of the installed DRAM chips. When Disabled, you can select the DRAM timing type.

► DRAM CAS# Latency

When the **Configure DRAM Timing by SPD** sets to [Disabled], the field is adjustable. This controls the CAS latency, which determines the timing delay (in clock cycles) before SDRAM starts a read command after receiving it.

► DRAM RAS# to CAS# Delay

When the **Configure DRAM Timing by SPD** sets to [Disabled], the field is adjustable. When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance.

► DRAM RAS# Precharge

When the **Configure DRAM Timing by SPD** sets to [Disabled], the field is adjustable. This item controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refreshing may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system.

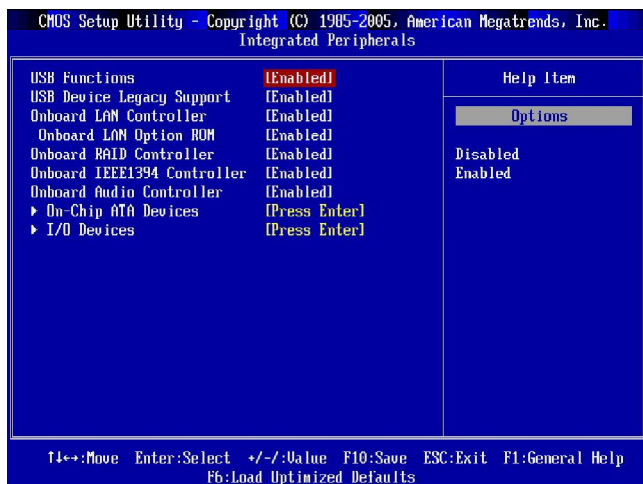
► **DRAM RAS# Activate to Prec**

hen the **Configure DRAM Timing by SPD** sets to [Disabled], the field is adjustable. The field specifies the idle cycles before precharging an idle bank.

► **Memory Hole**

In order to improve performance, certain space in memory can be reserved for ISA peripherals. This memory must be mapped into the memory space below 16MB. When this area is reserved, it cannot be cached.

Integrated Peripherals



► USB Functions

This setting allows you to enable/disable the onboard USB controller.

► USB Device Legacy Support

Select [Enabled] if you need to use a USB-interfaced device in the operating system.

► Onboard LAN Controller

These items are used to enable/disable the onboard LAN controller.

► Onboard LAN Option ROM

This item is used to decide whether to invoke the Boot ROM of the LAN controller.

► Onboard RAID Controller (for JMicro RAID)

This item allows you to enable/disable the onboard RAID controller.

► Onboard IEEE1394 Controller

This item allows you to enable/disable the onboard IEEE1394 controller.

► Onboard Audio Controller

This setting is used to enable/disable the onboard audio controller.

► On-Chip ATA Devices

Press <Enter> to enter the sub-menu and the following screen appears:

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.		
On-Chip ATA Devices		
PCI IDE BusMaster	[Enabled]	Help Item
SATA#1 Configuration	[Enhanced]	ENABLED: BIOS uses PCI busmastering for reading / writing to IDE drives.
Configure SATA#1 as	[IDE]	
SATA#2 Configuration	[Enabled]	
► AHCI Devices Group	[Press Enter]	

► PCI IDE BusMaster

Set this option to [Enabled] to specify that the IDE controller on the PCI local bus has bus mastering capability.

► SATA#1 Configuration

It allows you to configure the SATA#1 controller. Settings are:

- [Disabled] Disable the SATA devices
- [Compatible] Enable the SATA devices and release the IRQ14/ 15 for SATA devices
- [Enhanced] Select Enhanced if you want to use the SATA as IDE / RAID or AHCI function

► Configure SATA#1 as

When the **SATA#1 Configuration** sets to [Enhanced], the field is adjustable. It allows user to configure the SATA devices as IDE/ AHCI or RAID.

► SATA#2 Configuration

When the **Configure SATA#1 as** sets to [IDE], the field is adjustable. It allows you to Enable/ Disable the SATA#2 controller (SATA5-6).

► AHCI Devices Group

Press <Enter> to enter the sub-menu. If you set the [AHCI] in **Configure SATA#1 as**, it will show the Hard Disk status in the sub-menu.

► I/O Device

Press <Enter> to enter the sub-menu and the following screen appears:

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.		
I/O Devices		
Onboard Floppy Controller	[Enabled]	Help Item
COM Port 1	[3F8/IRQ4]	Allows BIOS to Enable or Disable Floppy Controller.
COM Port 2	[2F8/IRQ3]	
COM Port 2 Mode	[Normal]	
Parallel Port	[378]	
Parallel Port Mode	[Normal]	
Parallel Port IRQ	[IRQ7]	

► **Onboard Floppy Controller**

Select [Enabled] if your system has a floppy disk controller (FDD) installed on the system board and you wish to use it. If you install add-on FDC or the system has no floppy drive, select [Disabled] in this field.

► **COM Port 1/ 2**

Select an address and corresponding interrupt for the serial port 1/ 2.

► **COM Port 2 mode**

Select the com port 2 mode.

► **Parallel Port**

There is a built-in parallel port on the on-board Super I/O chipset that provides Standard, ECP, and EPP features. It has the following options:

[Disabled]	
[3BC]	Line Printer port 0
[278]	Line Printer port 2
[378]	Line Printer port 1

► **Parallel Port Mode**

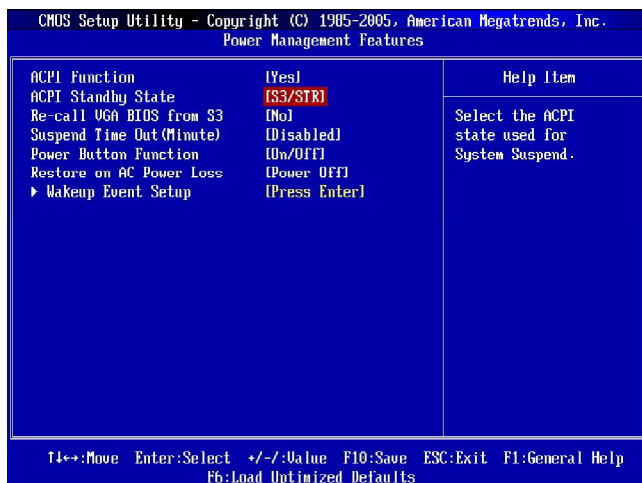
[Normal]	Standard Parallel Port
[EPP]	Enhanced Parallel Port
[ECP]	Extended Capability Port
[ECP + EPP]	Extended Capability Port + Enhanced Parallel Port
[Bi-Directional]	

To operate the onboard parallel port as Standard Parallel Port only, choose [SPP]. To operate the onboard parallel port in the EPP mode simultaneously, choose [EPP]. By choosing [ECP], the onboard parallel port will operate in ECP mode only. Choosing [ECP + EPP] will allow the onboard parallel port to support both the ECP and EPP modes simultaneously.

► **Parallel Port IRQ**

This item allows you to set parallel port IRQ.

Power Management Setup



Important

S3-related functions described in this section are available only when your BIOS supports S3 sleep mode.

► ACPI Function

This item is to activate the ACPI (Advanced Configuration and Power Management Interface) Function. If your operating system is ACPI-aware, such as Windows 2000/XP, select [Yes].

► ACPI Standby State

This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 2000/XP, you can choose to enter the Standby mode in S1(POS) or S3(STR) fashion through the setting of this field. Settings are:

- [S1/POS] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system context.
- [S3/STR] The S3 sleep mode is a lower power state where the information of system configuration and open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a "wake up" event occurs.
- [Auto] Auto arrange the power saving mode for ACPI function.

► Re-Call VGA BIOS From S3

When **ACPI Standby State** is set to [S3/STR], users can select the options in this field. Selecting [Yes] allows BIOS to call VGABIOS to initialize the VGA card when system wakes up (resumes) from S3 sleep state. The system resume time is shortened when you disable the function, but system will need an VGA driver to initialize the VGA card. Therefore, if the VGA driver of the card does not support the initialization feature, the display may work abnormally or not function after resuming from S3.

► Suspend Time Out (Minute)

If system activity is not detected for the length of time specified in this field, all devices except CPU will be shut off.

► Power Button Function

This feature sets the function of the power button. Settings are:

[On/ Off]	The power button functions as normal power off button.
[Suspend]	When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

► Restore On AC Power Loss

This item specifies whether your system will reboot after a power failure or interrupt occurs. Settings are:

[Power Off]	Always leaves the computer in the power off state.
[Power On]	Always leaves the computer in the power on state.
[Last State]	Restores the system to the status before power failure or interrupt occurred.

► Wakeup Event Setup

Press <Enter> and the following sub-menu appears.

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.	
Wakeup Event Setup	
Resume From S3 By USB Device	[Disabled]
S3/S4 Power on by PS/2 KB	[Disabled]
S3/S4 Power On by PS/2 Mouse	[Disabled]
Resume by PCI-E Device (PME)	[Enabled]
Resume by PCI Device (PME)	[Enabled]
Resume by RTC Alarm	[Enabled]
RTC Alarm Date (Days)	[15]
RTC Alarm Time	[12:30:30]
Help Item	
Disable/Enable RTC to generate a wake event.	

► Resume From S3 By USB Device

The item allows the activity of the USB device to wake up the system from S3 (Suspend to RAM) sleep state.

► S3/S4 Power on by PS/2 KB

This setting determines whether the system will be awakened from what power saving modes when input signal of the PS/2 keyboard is detected.

► Specific Key PowerOn

If **S3/S4 Power on by PS/2 KB** is set to *Specific Key*, then you can set a specific key in this field for the PS/2 keyboard to power on the system.

► S3/S4 Power On by PS/2 Mouse

This setting determines whether the system will be awakened from what power saving modes when input signal of the PS/2 mouse is detected.

► Resume by PCI-E Device (PME)

When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on PCIE device.

► Resume by PCI Device (PME)

When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on PCI device.

► Resume by RTC Alarm

The field is used to enable or disable the feature of booting up the system on a scheduled time/date.

► Date (of Month) Alarm

The field specifies the date for **Resume by RTC Alarm**.

► Time (hh:mm:ss) Alarm

The field specifies the time for **Resume by RTC Alarm**. Format is <hour><minute><second>.

PNP/PCI Configurations

This section describes configuring the PCI bus system and PnP (Plug & Play) feature. PCI, or **P**eripheral **C**omponent Interconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.



► Primary Graphics Adapter

This setting specifies which graphics card is your primary graphics adapter.

► PCI Latency Timer

This item controls how long each PCI device can hold the bus before another takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. For better PCI performance, you should set the item to higher values.

► PCI Slot 1/2 IRQ

These items specify the IRQ line for each PCI slot.

► IRQ Resource Setup

Press <Enter> to enter the sub-menu and the following screen appears.

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.		
IRQ Resource Setup		
IRQ3	[Available]	Help Item Options
IRQ4	[Available]	
IRQ5	[Available]	Available Reserved
IRQ7	[Available]	
IRQ9	[Available]	
IRQ10	[Available]	
IRQ11	[Available]	
IRQ14	[Available]	
IRQ15	[Available]	

► IRQ 3/4/5/7/9/10/11/14/15

These items specify the bus where the specified IRQ line is used.

The settings determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the IRQ pool, the end user can use these settings to reserve the IRQ by assigning an [Reserved] setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as [Available]. If all IRQs are set to [Reserved], and IRQ 14/15 are allocated to the onboard PCI IDE, IRQ 9 will still be available for PCI and PnP devices.



Important

IRQ (Interrupt Request) lines are system resources allocated to I/O devices. When an I/O device needs to gain attention of the operating system, it signals this by causing an IRQ to occur. After receiving the signal, when the operating system is ready, the system will interrupt itself and perform the service required by the I/O device.

► DMA Resource Setup

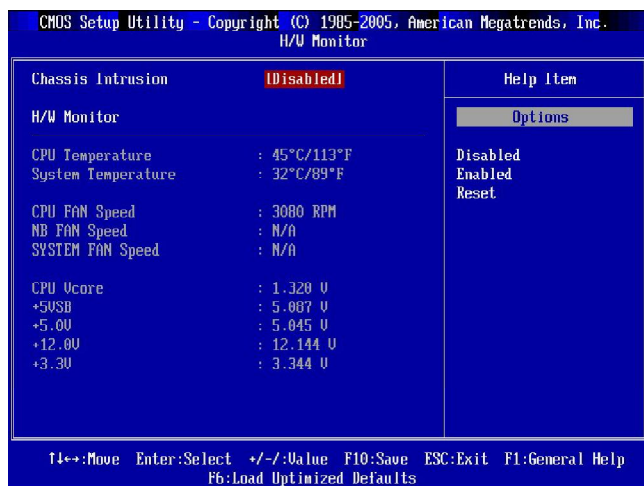
Press <Enter> to enter the sub-menu and the following screen appears.

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.		
DMA Resource Setup		
DMA Channel 0	[Available]	Help Item Options
DMA Channel 1	[Available]	
DMA Channel 3	[Available]	Available Reserved
DMA Channel 5	[Available]	
DMA Channel 6	[Available]	
DMA Channel 7	[Available]	

► DMA Channel 0/1/3/5/6/7

The settings determine if AMIBIOS should remove a DMA (Direct Memory Access) from the available DMAs passed to devices that are configurable by the system BIOS. The available DMA pool is determined by reading the ESCD NVRAM. If more DMAs must be removed from the pool, the end user can reserve the DMA.

H/W Monitor



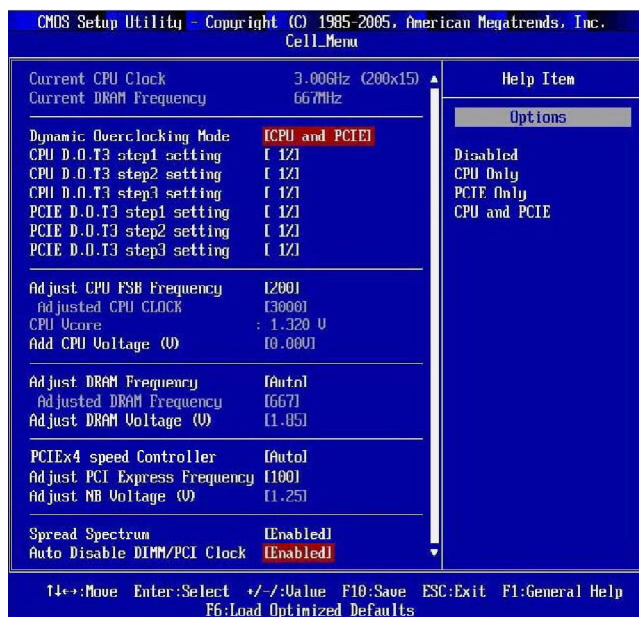
► Chassis Intrusion

The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to [Reset]. The setting of the field will automatically return to [Enabled] later.

► CPU/ System Temperature, CPU/ NB/ SYSTEM FAN Speed, CPU Vcore, +5VSB, +5.0V, +12.0V, +3.3V

These items display the current status of all of the monitored hardware devices/ components such as CPU voltage, temperatures and all fans' speeds.

Cell Menu



Important

Change these settings only if you are familiar with the chipset.

► Current CPU Clock/ Current DRAM Frequency

These items show the current clocks of CPU and Memory speed. Read-only.

► Dynamic OverClocking Mode

Dynamic Overclocking Technology is the automatic overclocking function, included in the MSI™'s newly developed CoreCell™ Technology. It is designed to detect the load balance of CPU while running programs, and to adjust the best CPU frequency automatically. When the motherboard detects CPU is running programs, it will speed up CPU automatically to make the program run smoothly and faster. When the CPU is temporarily suspending or staying in the low load balance, it will restore the default settings instead. Usually the Dynamic Overclocking Technology will be powered only when users' PC need to run huge amount of data like 3D games or the video process, and the CPU frequency need to be boosted up to enhance the overall performance. This item allows you to select the CPU/ PCIE or CPU+PCIE to overclock.

► CPU D.O.T3 step1/2/3 setting

The D.O.T has 3 steps to overclock the CPU, you can set the overclocking percentage for each step. When the CPU loading reaches to 20%, the CPU frequency will overclock according the setting of step1. When the CPU loading reaches to 50%, the CPU frequency will overclock according the setting of step2. When the CPU loading reaches to 80%, the CPU frequency will overclock according the setting of step3. These items will appear when the **Dynamic OverClocking Mode** set to **CPU only** or **CPU and PCIE**.

► PCIE D.O.T3 step1/2/3 setting

The D.O.T has 3 steps to overclock the PCIE, you can set the overclocking percentage for each step. When the CPU loading reaches to 20%, the PCIE frequency will overclock according the setting of step1. When the CPU loading reaches to 50%, the PCIE frequency will overclock according the setting of step2. When the CPU loading reaches to 80%, the PCIE frequency will overclock according the setting of step3. These items will appear when the **Dynamic OverClocking Mode** set to **PCIE only** or **CPU and PCIE**.



Important

Even though the Dynamic Overclocking Technology is more stable than manual overclocking, basically, it is still risky. We suggest user to make sure that your CPU can afford to overclocking regularly first. If you find the PC appears to be unstable or reboot incidentally, it's better to disable the Dynamic Overclocking or to lower the level of overclocking options. By the way, if you need to conduct overclocking manually, you also need to disable the Dynamic OverClocking first.

► Adjust CPU FSB Frequency

This item allows you to select the CPU Front Side Bus clock frequency (in MHz).

► Add CPU Voltage (V)

This item allows you to overclock the CPU voltage.



Important

Any changes for the voltage may cause a stability issue, so **changing the voltage for long-term purpose is NOT recommended.**

► Adjust DRAM Frequency

Setting to **Auto**, the system will auto detect the memory clock. Or you can select the DRAM frequency at your desire.

► Adjust DRAM Voltage (V)

Adjusting the DRAM voltage can increase the DDR speed.

► PCIe4 speed Controller

These items allow you to select the speed mode of PCIe x 4 slot.

► Adjust PCI Express Frequency

These items allow you to select the PCI Express frequency and overclock the processor by adjusting the PCI Express frequency to a higher frequency.

► Adjust NB Voltage (V)

It allows you to adjust the NB voltage.

► Spread Spectrum

This setting is used to enable or disable the Spread Spectrum feature. When overclocking, always set it to [Disabled].



Important

1. If you do not have any EMI problem, leave the setting at [Disabled] for optimal system stability and performance. But if you are plagued by EMI, select Enabled for EMI reduction.
2. The greater the Spread Spectrum value is, the greater the EMI is reduced, and the system will become less stable. For the most suitable Spread Spectrum value, please consult your local EMI regulation.
3. Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clock speed which may just cause your overclocked processor to lock up.

► Auto Disable DIMM/PCI Clock

This item is used to auto detect the DIMM/PCI slots. When set to [Enabled], the system will remove (turn off) clocks from empty DIMM/PCI slots to minimize the electromagnetic interference (EMI).

CPU and Memory Clock Overclocking

The **Adjust CPU FSB Frequency / Dynamic OverClocking Mode/ Adjust DRAM Frequency** are the items for you to overclock the CPU and the Memory. Please refer to the descriptions of these fields for more information.



Important

1. $CPU\ Speed = CPU\ FSB\ Frequency * CPU\ Ratio$
2. *This motherboard supports overclocking greatly. However, please make sure your peripherals and components are bearable for some special settings. Any operation that exceeds product specification is not recommended. Any risk or damage resulting from improper operation will not be under our product warranty.*

Two ways to save your system from failed overclocking...

Reboot

1. Press the Power button to reboot the system three times. Please note that, to avoid electric current to affect other devices or components, we suggest an interval of more than 10 seconds among the reboot actions.



2. At the fourth reboot, BIOS will determine that the previous overclocking is failed and restore the default settings automatically. Please press any key to boot the system normally when the following message appears on screen.

Warning !!! The previous performance of overclocking is failed, and the system is restored to the defaults setting.
Please press any key to continue...

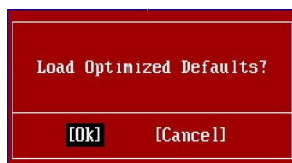
Clear CMOS

- Please refer to "chapter 2" for more information about how to clear CMOS data.

Load Optimized Defaults

The option on the main menu allows users to restore all of the BIOS settings to the default Optimized values. The Optimized Defaults are the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

When you select Load Optimized Defaults, a message as below appears:



Pressing Y loads the default factory settings for optimal system performance.

BIOS Setting Password

When you select this function, a message as below will appear on the screen:



Type the password, up to six characters in length, and press <Enter>. The password typed now will replace any previously set password from CMOS memory. You will be prompted to confirm the password. Retype the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.


When a password has been set, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Appendix A

Introduction to DigiCell

DigiCell, the most useful and powerful utility that MSI has spent much research and efforts to develop, helps users to monitor and configure all the integrated peripherals of the system, such as audio program, power management, MP3 files management and communication / 802.11g WLAN settings. Moreover, with this unique utility, you will be able to activate the MSI well-known features, Live Update and Dual Core Center, which makes it easier to update the BIOS/drivers online, and to monitor the system hardware status (CPU/Fan temperature and speed) or to overclock the CPU.

Activating DigiCell

Once you have your DigiCell installed (locate the setup source file in the setup CD accompanying with your mainboard, path: **Utility --> MSI Utility --> MSI DigiCell**), it will have an icon  in the system tray, a short cut icon on the desktop, and a short cut path in your "Start-up" menu. You may double-click on each icon to enable DigiCell.



short-cut icon in the system tray



short-cut path in the start-up menu
(path: Start-->Programs-->MSI-->DigiCell)

Main

Before using this utility, it is required to have all the integrated peripherals/cards (LAN card, Wireless LAN card, MegaStick... etc.) and all the necessary drivers (onboard LAN driver, audio driver, CoreCenter, Live Update... etc.) installed correctly.

The icon representing each item will be lit up if it is inserted/installed correctly and properly. Otherwise, the icon will remain gray and user is not able to view the functionality/connection of that item.



Introduction:

Click on each icon appearing above to enter the sub-menu to make further configuration.

MSI

Click on this button to link to MSI website:

<http://www.msi.com.tw>.

Quick Guide

Click on this button and the quick guide of **DigiCell** will be displayed for you to review.

H/W Diagnostic

In this sub-menu, it provides the information of each DigiCell button for you to check if the representing peripherals/cards/drivers are correctly installed.

Comm.

In this sub-menu, you can see the configuration details for communication products, including the status, strength, speed and channel of the connection of the Ethernet LAN & Wireless LAN.

Software Access Point

In this sub-menu, you can change your connection mode to different ones, and configure the advanced settings for each mode, such as the authentication encryption... etc.

Live Update

You can take advantage of **Live Update** to detect and update BIOS and drivers online.

Dual Core Center

You can take advantage of **Dual Core Center** to monitor the health status of your mainboard/ graphics card, and to overclock under Windows OS if your system supports overclocking function. (See appendix of **Dual Core Center** for detail information.)

MEGA STICK

If you have your MEGA STICK connected to your system, this icon will be lit up. Click this blue icon to turn DigiCell into a MP3 player, and then you can load media files from your MEGA STICK or the system, and edit the preferred playlist.

Audio Speaker Setting

In this sub-menu, you can configure and test the multi-channel audio function, speakers, sound effect and environment.

Power on Agent

In this sub-menu, you can configure date, time and auto-executed programs of the power-on, power-off and restarting features.



Important

*Click on **back** button in every sub-menu and it will bring you back to the main menu.*

H/W Diagnostic

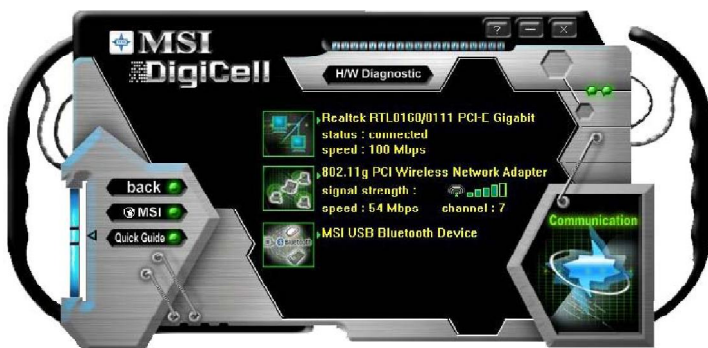
In the **H/W Diagnostic** sub-menu, you can see the information, status and note of each DigiCell. You may double check the connection and installation of the item marked as gray.



You may also click on the **Mail to MSI** button to send your questions or suggestions to MSI's technical support staff.

Communication

In the **Communication** sub-menu, you can see the status of all the LAN / WLAN / Bluetooth on the screen if the hardware is installed. The first icon indicates the onboard LAN on your system, the second icon indicates the wireless LAN status, and the third one is the information about the bluetooth on your system. Click on each item for details.



This icon indicates the information and connection status of onboard LAN, which is read-only.



The second icon indicates the wireless connection. You may click this icon to configure the advanced settings in the **WLAN Card Mode** dialogue box. Please note that it is only available when the **Software Access Point** is set to **WLAN Card Mode**.



The third icon indicates the connection using bluetooth devices. If your system is connected to the bluetooth device, the icon will light up.

Software Access Point

In the **Software Access Point** sub-menu, you can see the communication status on your system and choose the desired software access point mode by clicking on the desired icon, in which the default settings are configured for your usage. The default software access point mode is set to **WLAN Card Mode**. For more advanced security settings and channels switching, click on **"Setting"** button to enter its sub-menu



Terminology

Here are the introduction of WLAN / AP communication terminology.

WEP Key

In the wireless network environment, the administrator can set up password (Network Key) to protect the network from being attacked or unauthorized access. When building the network, you can set up 4 sets of WEP keys, which can be 5 characters (10 hex-adecimal digital) or 13 characters (26 hex-adecimal digital) and specify one of them to use.

Ad-hoc Mode

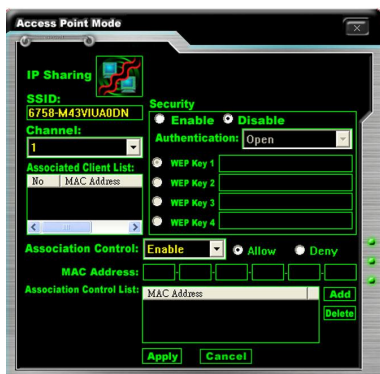
An Ad-hoc network is a local area network or other small network, especially one with wireless or temporary plug-in connections, in which some of the network devices are part of the network only for the duration of a communications session. Users in the network can share files, print to a shared printer, and access the Internet with a shared modem. In this kind of network, new devices can be quickly added; however, users can only communicate with other wireless LAN computers that are in this wireless LAN workgroup, and are within range.

Infrastructure Mode

The difference between Infrastructure network and Ad-hoc network is that the former one includes an Access Point. In an Infrastructure network, the Access Point can manage the bandwidth to maximize bandwidth utilization. Additionally, the Access Point enables users on a wireless LAN to access an existing wired network, allowing wireless users to take advantage of the wired networks resources, such as Internet, email, file transfer, and printer sharing. The scale and range of the Infrastructure networking are larger and wider than that of the Ad-hoc networking.

Access Point Mode

Click on “**Setting**” button of the **Access Point Mode** and the following screen will display.



IP Sharing

Click on this icon to enable/disable the IP sharing. The default of this setting is disabled.



Disabled



Enabled

Enabling/disabling IP sharing depends on the different situation. For example:

1. If your family and you are getting on Internet at home with multi computers, and your ISP only provides one IP for you, you may need to enable **IP Sharing** function in order to use this one IP to get on Internet with multi computers simultaneously.
2. If you are getting on Internet in office, usually the LAN card will automatically get the IP this computer uses. In this case you don't have to enable this function.

SSID

Means Service Set Identifier, a **unique** name shared among all points in a wireless network. It must be **identical** for all points in the network. Then the card will be able to connect to an access point with the same SSID.

Channel

Specifies the operating radio frequency channel in **Infrastructure mode**, which should be set to an available one (ex: with less traffic to ensure the stable and better connection).

Associated Client List

This option is to display information of stations that are currently associated to your wireless gateway.

Association Control

This option allows you to control which PC can connect to the wireless LAN. If you

enable this feature, only PCs with MAC address located in Association Control List can connect to the wireless LAN.

MAC Address

MAC stands for Media Access Control. A MAC address is the hardware address of a device connected to a network.

Security

This option allows you to enable/disable the authentication function.

Authentication

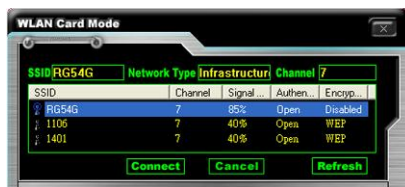
Open: Communicates the key across the network.

Shared: Devices must have identical WEP settings to communicate.

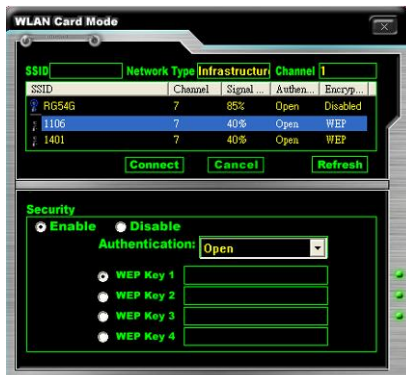
WLAN Card Mode

Click on “**Setting**” button of the **WLAN Card Mode** for the WEP status of your APs.

If the AP you are selecting (the highlighted one) is not encrypted (**Disabled** shown in the **Encryption** column), the screen will display as below. You can click “**Connect**” to make connection to that AP, click “**Cancel**” to close this dialogue box, or click “**Refresh**” button to update the available WLAN connections.



If the network you are selecting is encrypted (**WEP** shown in the **Encryption** column), the screen will display as below. You need to enter the correct WEP key defined by AP in the specified **WEP Key 1~4** fields to make the connection.

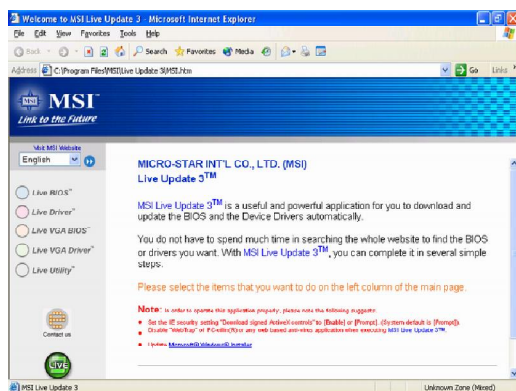


Live Update

Click on the **Live Update** icon in the main menu and the **Live Update** program will be enabled.

The Live Update 3™ is a tool used to detect and update your BIOS/drivers/VGA BIOS/VGA Driver/Utility online so that you don't need to search for the correct BIOS/driver version throughout the whole Web site. To use the function, you need to install the "MSI Live Update 3" application. After the installation, the "MSI Live Update 3" icon (as shown on the right) will appear on the screen.

Double click the "MSI Live Update 3" icon, and the following screen will appear:



Several buttons are placed on the left column of the screen. Click the desired button to start the update process.

Live BIOS – Updates the BIOS online.

Live Driver – Updates the drivers online.

Live VGA BIOS – Updates the VGA BIOS online.

Live VGA Driver – Updates the VGA driver online.

Live Utility – Updates the utilities online.

If the product you purchased does not support any of the functions listed above, a "sorry" message is displayed. For more information on the update instructions, insert the companion CD and refer to the "Live Update Guide" under the "Manual" Tab.

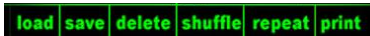
MEGA STICK

In the **MEGA STICK** sub-menu, you can configure the settings of MSI MEGA STICK and the media files (*.m3u, *.mp3, *.wav, *.cda, *.wma) on your system.



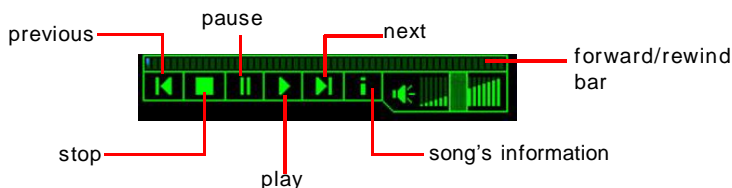
Basic Function

Here you can edit your own play list with the buttons “load”, “save”, “delete”, “shuffle”, “repeat” & “print”.



- | | |
|----------------|---|
| Load | To load media files or the playlist of mp3 files (*.m3u) on your system or on your MEGA STICK. |
| Save | To save a loaded playlist of mp3 files (*.m3u) on your system or on your MEGA STICK. |
| Delete | Click on the media files in the Play List: field and use “Delete” button to remove the media file from the play list. You may remove multi media files simultaneously by using “Ctrl” to select multi files. |
| Shuffle | To play the media file in the Play List: in a random order. |
| Repeat | To repeat the selected files in the Play List: . |
| Print | This button has 2 functions: <ol style="list-style-type: none"> 1. To print out the details of current play list through your printer with the following information:
Song title --- Song length --- Singer name 2. To save the details of current play list and save the file in the plain text file format in the \\Program files\\MSI\\DigiCell\\MyMusic.txt for your reference. The <i>MyMusic.txt</i> file is with the following information:
Song title --- Song length --- Singer name |

There is also a toolbar for you to execute some basic function, like play, stop, pause, previous/next song, song info and volume adjust. There is also a scroll bar on the top for you to forward/rewind.



Right-click on the MP3 file and choose “Info”, a **MP3 Info** dialogue will pop up to show the information of the file, including the title, artist, album, release year and others. You may also add your own comment in the **comment** field. Then click “**Save**” to save the change, click “**Cancel**” to discard the change, or click “**Remove**” to remove all this information.

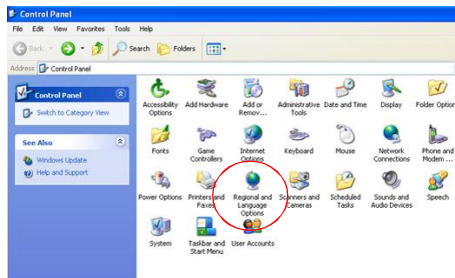


Non-Unicode programs supported

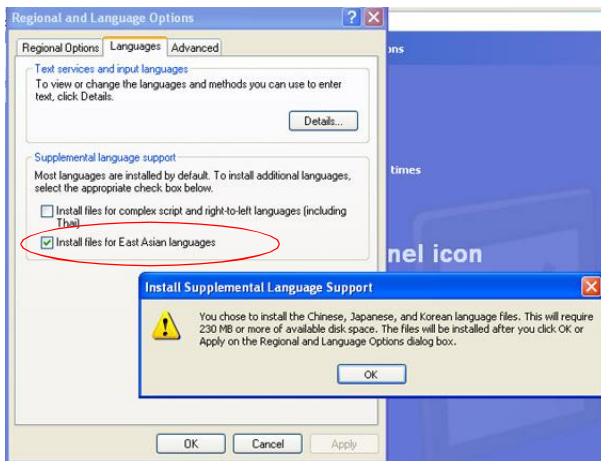
If you are using an operating system in European languages, and you'd like to play the media files in MEGA STICK with East-Asian languages (such as Chinese, Japanese... etc.), it is possible that the file names display incorrectly.

However, you can install the **Supplemental Language Support** provided by Microsoft to solve this problem. You need to have your Microsoft Setup CD prepared in the CD-ROM. The system will start to install the necessary components after the settings are configured here. Follow the steps described below.

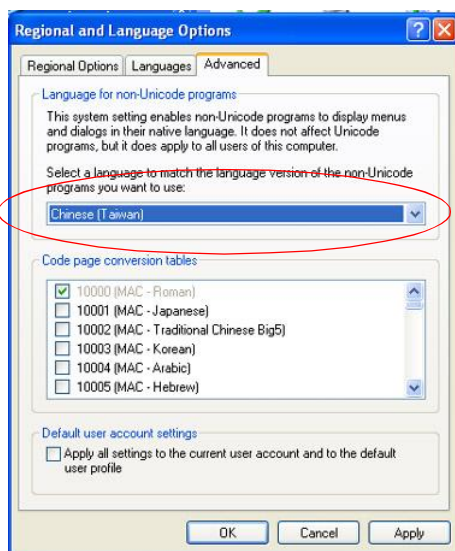
1. Go to [Control Panel] and choose [Regional and Language Options].



2. Go to the [Languages] tab and enable the check box of [Install files for East Asian languages]. A dialogue box will pop up to remind you the above selection is chosen.



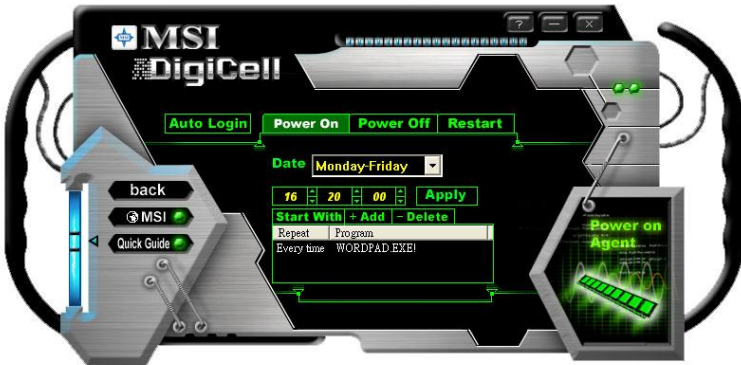
3. Then go to the [Advanced] tab and select ***the language you want to be supported*** (the language of the filename in the MegaStick) from the drop-down list in the [Language for non-Unicode programs], then click [Apply]. The system will install the necessary components from your Microsoft Setup CD immediately.



Power On Agent

In the **Power on Agent** sub-menu, you can configure setting of power-on, power-off and restarting status.

In the screen below, you can set the date, time, start-up programs respectively for power-on, power-off and restarting.



Power On

Here are the available settings for **Power On** function:

- Date** Use the drop-down list to select the date for power-on.
- Time** Use the arrow keys to select the hour/minute/second for power-on, power-off and restarting. Then click "**Apply**" to save the changes. As you click "**Apply**", the following dialogue will appear to show you the next power-on schedule, and the system will start to count down to restart. Click "**OK**" to restart the computer right away or click "**Later**" to restart your computer later.



Important

Please note that the new setting will not take effect until you restart your computer.

Power Off / Restart

You may configure the time (in the format hh:mm:ss) for the next power-off / restart.

Start With

Use the button **“+Add”** to add the start-up programs as DigiCell is activated next time. For example, you may like to have Outlook activated or a specified website linked when you get to the office every morning.

Step 1: Click on the **Program:** field and click **“>>”** button to browse for the path of Outlook or Internet Explorer.

Step 2: Click on **“OK”** to apply the setting.

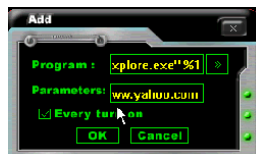
Step 3: For specified file or specified website, you may enter the file name with the complete path or the website link in the **Parameters:** field.



add the desired start-with program



To activate Outlook as DigiCell is enabled next time



To activate a specified website as DigiCell is enabled next time

Of course you may use the button **“-Delete”** to remove the added programs, or you can right-click on the selected program and click **Delete**.



delete the added program



Important

You can also enable the **Every turn on** function, which will enable the specified program(s) and file(s) every time the DigiCell utility runs.

Auto Login



Since the **Power On** function allows the system to power on automatically, you may have to enable this **Auto Login** function in the following situations:

1. If you are using a computer belonging to a domain in office, and you need to enter your user name & password everytime when you boot up your computer.
2. If there are multi users using the same computer and you'd like to power on the computer automatically with one specific user.

Enable Auto Login

Enable this setting if you want to use the **Auto Login** feature. It supports the following operating systems: Win9X, Windows ME, Windows 2000 & Windows XP.

Default User Name

It is only available for Windows 2000 & Windows XP.

- If you are using a computer belonging to a domain in office, please enter your login user name in this field.
- If you are using a computer with multi users (for Windows XP operating system), please enter the user name you'd like to auto power-on in this field.

Default Password

It is only available for Windows 2000 & Windows XP.

- If you are using a computer belonging to a domain in office, please enter your login password in this field.
- If you are using a computer with multi-users (for Windows XP operating system), please enter the password for the user name you'd like to auto power-on in this field.

Appendix B

Dual Core Center

Dual Core Center, the most useful and powerful utility that MSI has spent much research and efforts to develop, helps users to monitor or configure the hardware status of MSI Mainboard & MSI Graphics card in windows, such as CPU/ GPU clock, voltage, fan speed and temperature.

Before you install the Dual Core Center, please make sure the system has meet the following requirements:

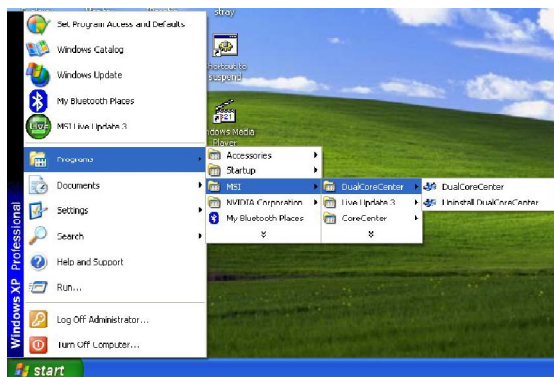
1. Compatible CPU with PCI Express slot.
2. 256MB system memory.
3. CD-ROM drive for software installation.
4. Operation system: Windows XP.
5. DotNet Frame Work 2.0

Activating Dual Core Center

Once you have your Dual Core Center installed (locate the setup source file in the setup CD accompanying with your mainboard, path: **Utility --> MSI Utility --> Dual Core Center**), it will have an icon in the system tray, a short cut icon on the desktop, and a short cut path in your "Start-up" menu. You may double-click on each icon to enable Dual Core Center.



short-cut icon in the system tray



short-cut path in the start-up menu
(path: Start-->Programs-->MSI-->
DualCoreCenter-->DualCoreCenter)



Important

All the information/ pictures in this appendix are for reference only and might different from your system.

Main

Before using this utility, we have to remind you: only when installing the MSI V044 (V044 has to install with the version 8.26 or newer driver)/ V046 or V060 graphics card can activate the full function of this utility. If you install a graphics card of other brand, only hardware status of the MSI mainboard would be available.



Introduction:

Click each button appearing above to enter sub-menu to make further configuration or to execute the function.

MB

Click MB button to read current CPU temperature, FSB and CPU clock of mainboard will show below.

VGA

Click VGA button to read current GPU temperature, GPU clock and memory clock of graphics card will show below.

DOT

Click DOT button to enable or disable the Dynamic Overclocking Technology.

AV/ Game/ Office/ Silence/ Cool

MSI provides five common settings for different environments. The settings had been set to optimal values to reach better performance in each environment. Click the button you need.

**Important**

Before clicking the AV/ Game/ Office/ Silence or Cool button, select Smooth mode or Sharp mode to decide whether you want the system to reach the optimal values smoothly or quickly.

Sharp mode**Smooth mode****Clock**

In this sub-menu, you can adjust and monitor the clocks of MB and graphics card.

Voltage

In this sub-menu, you can adjust and monitor the voltages of MB and graphics card.

FAN Speed

In this sub-menu, you can adjust and monitor the fan speeds of MB and graphics card.

Temperature

In this sub-menu, you can monitor the temperatures of MB and graphics card.

User Profile




In this sub-menu, you can set the values of clock, voltage and fan speed by your need and save them in a profile. You can save 3 profiles for further use.

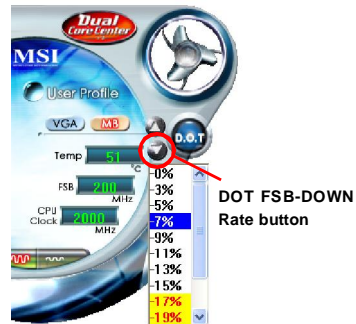
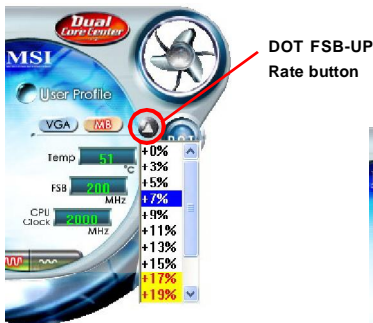
**Important**

Click on the icon , the clock, voltage, fan, and temperature buttons will appear beside the icon.



DOT (Dynamic OverClocking)




Dynamic Overclocking Technology is an automatic overclocking function, included in the MSI™'s newly developed Dual CoreCenter Technology. It is designed to detect the loading of CPU/ GPU while running programs, and to over-clock automatically. When the motherboard detects that the loading of CPU is exceed the default threshold for a time, it will speed up the CPU and fan automatically to make the system run smoother and faster. When the graphics card detects that the loading of GPU is exceed the default threshold for a time, it will speed up the GPU, memory, fan and voltage automatically to make the system run smoother and faster. When the CPU/ GPU is temporarily suspending or staying in low loading balance, it will restore the default settings instead. Usually the Dynamic Overclocking Technology will be powered only when users' PC runs huge amount of data, like 3D games or video process, and the motherboard/ graphic card need to be boosted up to enhance the overall performance. There will be several selections when you click the DOT rate button (include increase rate  and decrease rate  rate buttons), to select the DOT level, then you have to click the DOT button  to apply the DOT function.

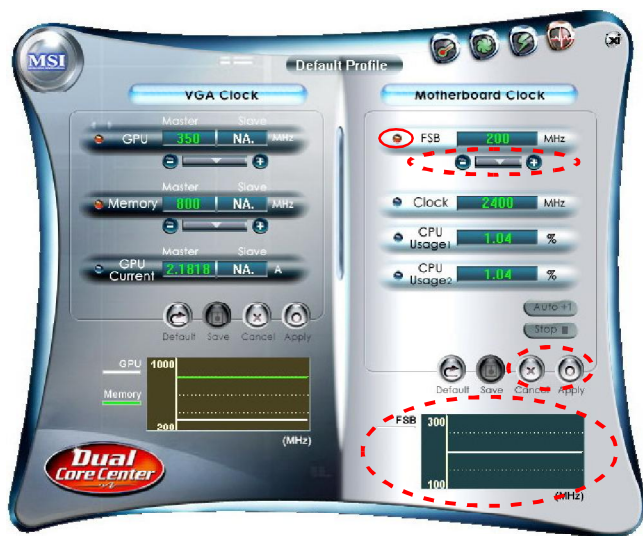


Important

Even though the Dynamic Overclocking Technology is more stable than manual overclocking, basically, it is still risky. We suggest user to make sure that your CPU can afford to overclock regularly first. If you find the PC appears to be unstable or reboot incidentally, it's better to lower the level of overclocking options. By the way, if you need to conduct overclocking manually, please do not to apply the DOT function.

Clock

In the **Clock** sub-menu, you can see clock status (including FSB/ CPU clock of mainboard and GPU/ memory clock of graphics card) of your system. And you can select desired value for overclocking. There will be several items for you to select for overclocking after you click  button. You can click the plus sign button  to increase the clock, or click the minus sign button  to decrease the clock. And finally, click the Apply button to apply the values adjusted. If you do not want to apply the adjustments, click the Cancel button to cancel. Or click the Default button to restore the default values.






On the underside, it shows the graphs of the clocks. Only the curves of the item which the button is lit up with red color will be shown.

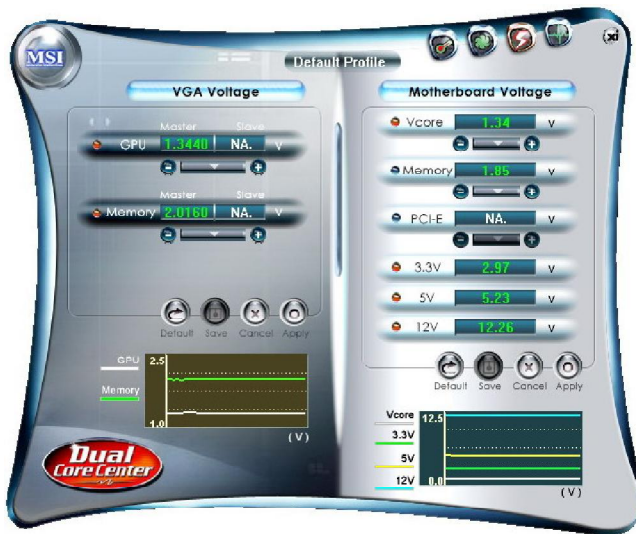


Important

*In the user profile, clicking the **Save** button can save the changes to it. In the default profile, the Save button is not available.*

Voltage

In the **Voltage** sub-menu, you can see voltage status (including Vcore, memory, GPU voltage... etc.) of your system, and you can select desired value for overclocking. It will show several items to select for overclocking after you click the  button. You can click the plus sign button  to increase the voltage, or click the minus sign button  to decrease. And finally, click the Apply button to apply the adjustments. If you do not want to apply the adjustments, click the Cancel button to cancel. Or click the Default button to restore the default values.






On the underside, it shows the graphs of the voltages. Only the curves of the item which the button is lit up with red color will be shown.

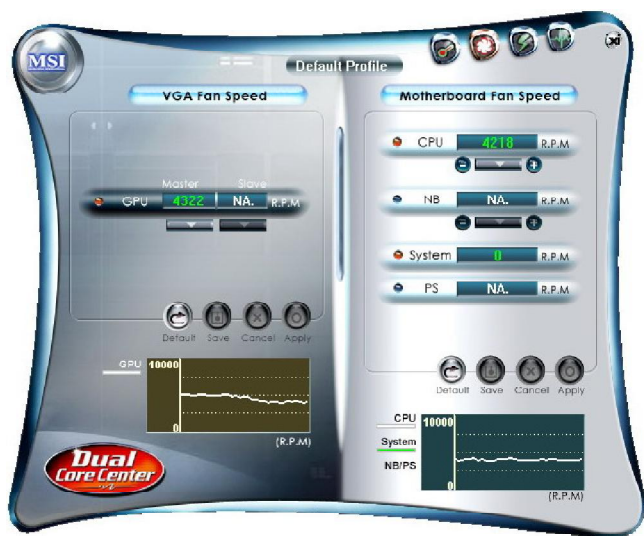


Important

*In the user profile, clicking the **Save** button can save the changes to it. In the default profile, the Save button is not available.*

FAN Speed

In the **FAN Speed** sub-menu, you can read fan status of your system. Select higher speed for better cooling effect. There are several sections for you to change the fan speed to a section after clicking  button. Click the plus sign button  to increase the fan speed to a section, or click the minus sign button  to decrease. Or click the Default button to restore the default values.



On the underside, it shows the graphs of the fan speed. Only the curves of the item which the button is lit up with red color will be shown.

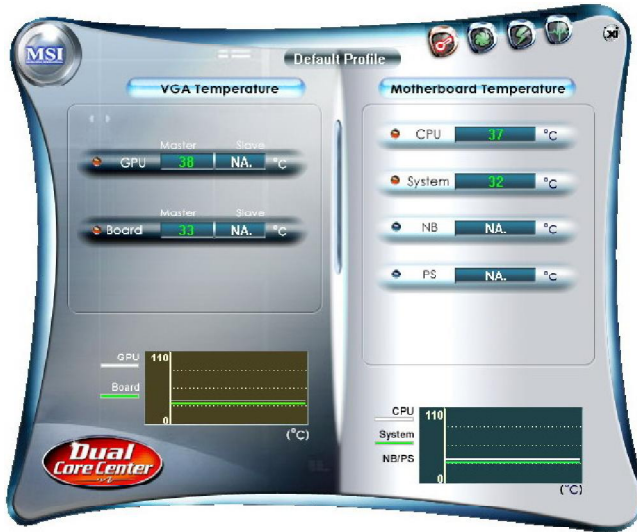


Important

1. When you set the fan speed manually, please make sure to disabled the "Smart FAN Target" item in the BIOS.
2. In the user profile, clicking the **Save** button can save the changes to it. In the default profile, the Save button is not available.

Temperature

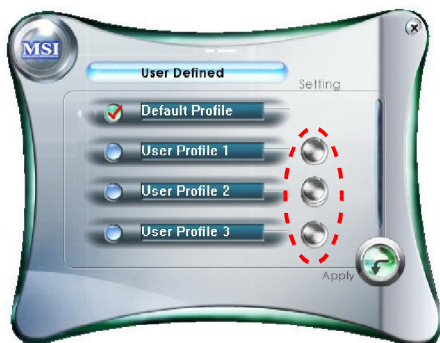
In the **Temperature** sub-menu, you can see temperature status of your system.






On the underside, it shows the graphs of the temperatures. Only the curves of the item which the button is lit up with red color will be shown.

User Profile

In the **User Profile** sub-menu, click the setting button that besides the user profile bar, and the next screen will appear.




Here you can define the clock/ fan speed/ voltage by your need, click the  button to choose a value quickly, or click the plus  / minus sign  button to increase/ decrease the value.

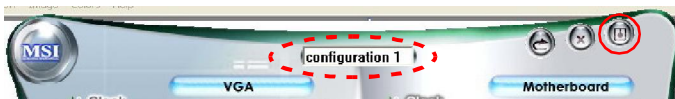


Use the draw bar to set the max system temperature. When the system temperature exceeds the threshold you defined, the system will pop up a warning message and shut down the system.

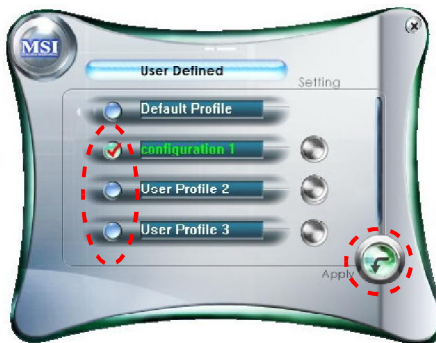
Use the draw bar to set the minimal fan speed. When the fan speed is lower than the threshold you defined, the system will pop up a warning message.



After setting all values you need, you can change the user profile name in the box then click the save button  to save all changes in a profile.



Finally, you can choose the user profile by click the button in the left side and click the Apply button to load the user profile.



Appendix C

Intel ICH8R SATA RAID

The ICH8R (NH82801GR) provides a hybrid solution that combines six independent SATAII ports for support of up to six Serial ATAII (Serial ATAII RAID) drives.

It offers RAID level 0 (Striping), RAID level 1 (Mirroring and Duplexing), RAID level 5 (Block Interleaved Distributed Parity), RAID level 10 (A Stripe of Mirrors) and Intel® Matrix Storage Technology.

ICH8R Introduction

The ICH8R provides a hybrid solution that combines 6 independent SATAII ports for support of up to 6 Serial ATAII (Serial ATAII RAID) drives.

Serial ATAII (SATAII) is the latest generation of the ATA interface. SATA hard drives deliver blistering transfer speeds up to 300MB/sec. Serial ATA uses long, thin cables, making it easier to connect your drive and improving the airflow inside your PC. The most outstanding features are:

1. Supports 300MB/s transfers with CRC error checking.
2. Supports Hot-plug-n-play feature.
3. Data handling optimizations including tagged command queuing, elevator seek and packet chain command.

Intel® ICH8R offers RAID level 0 (Striping), RAID level 1 (Mirroring and Duplexing), RAID level 5 (Block Interleaved Distributed Parity), RAID level 10 (A Stripe of Mirrors) and Intel® Matrix Storage Technology.

RAID 0 breaks the data into blocks which are written to separate hard drives. Spreading the hard drive I/O load across independent channels greatly improves I/O performance. RAID 1 provides data redundancy by mirroring data between the hard drives and provides enhanced read performance. RAID 5 Provides data striping at the byte level and also stripe error correction information. This results in excellent performance and good fault tolerance. Level 5 is one of the most popular implementations of RAID. RAID 10 Not one of the original RAID levels, multiple RAID 1 mirrors are created, and a RAID 0 stripe is created over these. Intel Matrix RAID Technology is the advanced ability for two RAID volumes to share the combined space of two hard drives being used in unison.



Important

The least number of hard drives for RAID 0, RAID 1 or Matrix mode is 2. The least number of hard drives for RAID 10 mode is 4. And the least number of hard drives for RAID 5 mode is 3.

All the information/ volumes/ pictures listed in your system might differ from the illustrations in this appendix.

BIOS Configuration

The Intel Matrix Storage Manager Option ROM should be integrated with the system BIOS on all motherboards with a supported Intel chipset. The Intel Matrix Storage Manager Option ROM is the Intel RAID implementation and provides BIOS and DOS disk services. Please use <Ctrl> + <I> keys to enter the “Intel(R) RAID for Serial ATA” status screen, which should appear early in system boot-up, during the POST (Power-On Self Test). Also, you need to enable the RAID function in BIOS to create, delete and reset RAID volumes.

Using the Intel Matrix Storage Manager Option ROM

1. Creating, Deleting and Resetting RAID Volumes:

The Serial ATA RAID volume may be configured using the RAID Configuration utility stored within the Intel RAID Option ROM. During the Power-On Self Test (POST), the following message will appear for a few seconds:



Important

The “Driver Model”, “Serial #” and “Size” in the following example might be different from your system.

```
Intel(R) Matrix Storage Manager option ROM v6.0.0.1017 ICH8R wRAID5
Copyright(C) 2003-06 Intel Corporation, All Rights Reserved.'
```

```
RAID Volumes
None defined.
```

```
Physical Disks::
```

Port	Device Model	Serial #	Size	Type/Status(Vol ID)
0	HDS722580VLSA80	VNRB3EC20549SL	76.7GB	Non-RAID Disk
1	HDS722580VLSA80	VNRB3EC20559SL	76.7GB	Non-RAID Disk
2	HDS722580VLSA80	VNRB3EC20569SL	76.7GB	Non-RAID Disk
3	HDS722580VLSA80	VNRB3EC20579SL	76.7GB	Non-RAID Disk

```
Press <CTRL-I> to enter Configuration Utility..
```

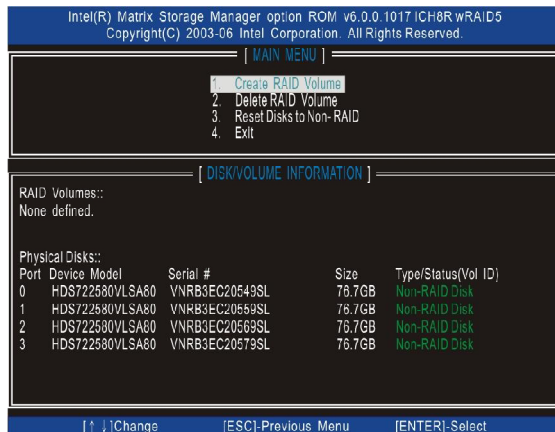
After the above message shows, press <Ctrl> and <I> keys simultaneously to enter the RAID Configuration Utility.



Important

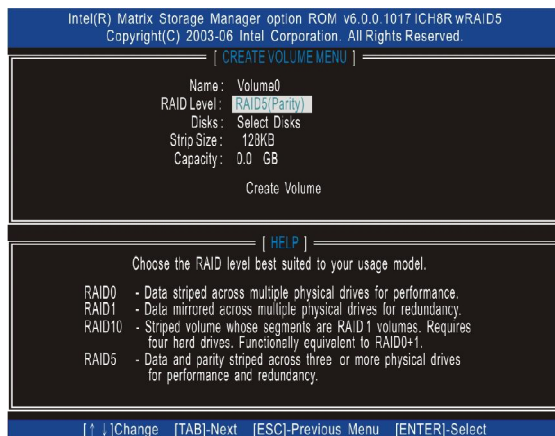
The following procedure is only available with a newly-built system or if you are reinstalling your OS. It should not be used to migrate an existing system to RAID.

After pressing the <Ctrl> and <I> keys simultaneously, the following window will appear:

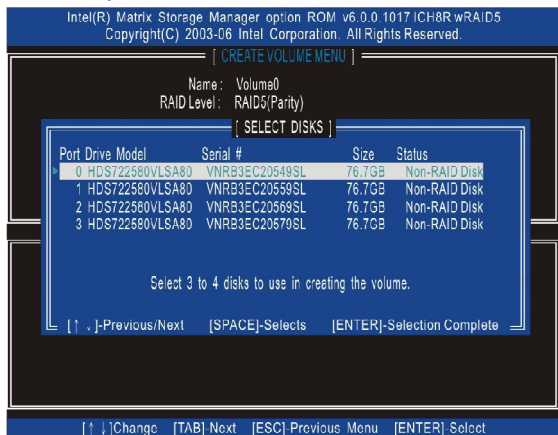


(1) Create RAID Volume

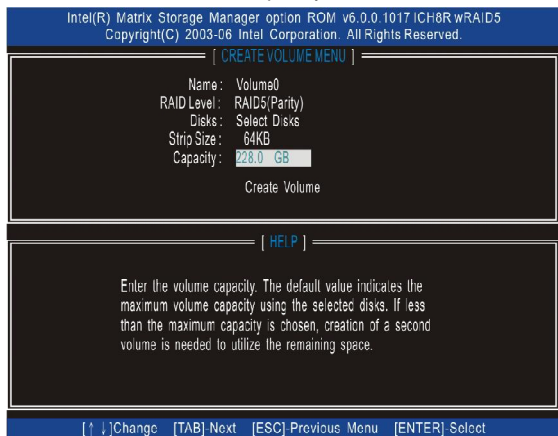
1. Select option 1 "Create RAID Volume" and press <Enter> key. The following screen appears. Then in the **Name** field, specify a RAID Volume name and then press the <TAB> or <Enter> key to go to the next field.
2. Use the arrow keys to select the RAID level best suited to your usage model in **RAID Level**.



3. In the **Disk** field, press <Enter> key and the following screen appears. Use <Space> key to select the disks you want to create for the RAID volume, then click <Enter> key to finish selection.



4. Then select the strip value for the RAID array by using the “upper arrow” or “down arrow” keys to scroll through the available values, and pressing the <Enter> key to select and advance to the next field. The available values range from 4KB to 128 KB in power of 2 increments. The strip value should be chosen based on the planned drive usage. Here are some typical values:
RAID0 – 128KB
RAID10 – 64KB
RAID5 – 64KB
5. Then select the capacity of the volume in the **Capacity** field. The default value is the maximum volume capacity of the selected disks.





Important

Since you want to create two volumes (Intel Matrix RAID Technology), this default size (maximum) needs to be reduced. Type in a new size for the first volume. As an example: if you want the first volume to span the first half of the two disks, re-type the size to be half of what is shown by default. The second volume, when created, will automatically span the remainder of two hard drives.

- Then the following screen appears for you to confirm if you are sure to create the RAID volume. Press <Y> to continue.

```

Intel(R) Matrix Storage Manager option ROM v6.0.0 1017 ICH8R wRAID5
Copyright(C) 2003-06 Intel Corporation. All Rights Reserved.

[ CREATE VOLUME MENU ]

Name: Volume0
RAID Level: RAID5(Parity)
Disks: Select Disks
Strip Size: 64KB
Capacity: 228.0 GB

WARNING: ALL DATA ON SELECTED DISKS WILL BE LOST.
Are you sure you want to create this volume? (Y/N):

Press "ENTER" to Create the specified volume.

[↑ ↓]Change [TAB]Next [ESC]Previous Menu [ENTER]Select
  
```

- Then the following screen appears to indicate that the creation is finished.

```

Intel(R) Matrix Storage Manager option ROM v6.0.0 1017 ICH8R wRAID5
Copyright(C) 2003-06 Intel Corporation. All Rights Reserved.

[ MAIN MENU ]

1. Create RAID Volume
2. Delete RAID Volume
3. Reset Disk to Non-RAID
4. Exit

[ DISK/VOLUME INFORMATION ]

RAID Volumes::
ID Name Level Strip Size Status Bootable
0 Volume0 RAID5(Parity) 64KB 228.0GB Normal Yes

Physical Disks::
Port Device Model Serial # Size Type/Status(Vol ID)
0 HDS722580VLSA80 VNRB3EC20549SL 76.7GB Member Disk(0)
1 HDS722580VLSA80 VNRB3EC20559SL 76.7GB Member Disk(0)
2 HDS722580VLSA80 VNRB3EC20569SL 76.7GB Member Disk(0)
3 HDS722580VLSA80 VNRB3EC20579SL 76.7GB Non-RAID Disk

[↑ ↓]Change [ESC]Previous Menu [ENTER]Select
  
```

(2) Delete RAID Volume

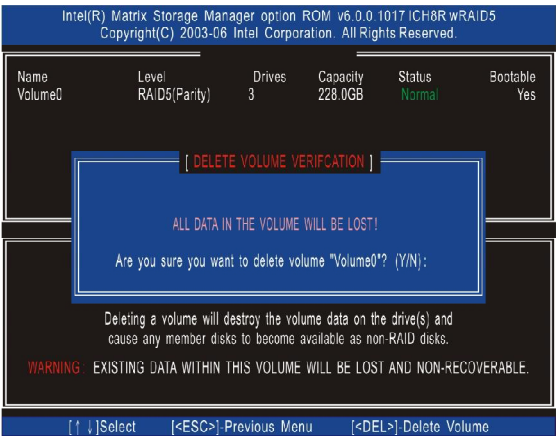
Here you can delete the RAID volume, but please be noted that all data on RAID drives will be lost.



Important

If your system currently boots to RAID and you delete the RAID volume in the Intel RAID Option ROM, your system will become unbootable.

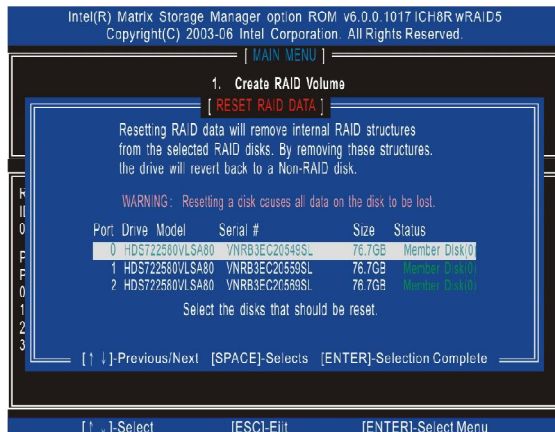
Select option 2 **Delete RAID Volume** from the main menu window and press <Enter> key to select a RAID volume for deletion. Then press <Delete> key to delete the selected RAID volume. The following screen appears.



Press <Y> key to accept the volume deletion.

(3) Reset Disks to Non-RAID

Select option 3 **Reset Disks to Non-RAID** and press <Enter> to delete the RAID volume and remove any RAID structures from the drives. The following screen appears:



Press <Y> key to accept the selection.



Important

1. You will lose all data on the RAID drives and any internal RAID structures when you perform this operation.
2. Possible reasons to 'Reset Disks to Non-RAID' could include issues such as incompatible RAID configurations or a failed volume or failed disk.

Installing Software

Install Driver in Windows XP / 2000

† New Windows XP / 2000 Installation

The following details the installation of the drivers while installing Windows XP / 2000.

1. Start the installation:
Boot from the CD-ROM. Press F6 when the message "Press F6 if you need to install third party SCSI or RAID driver" appears.
2. When the Windows XP/ 2000 Setup window is generated, press S to specify an Additional Device(s).
3. Insert the driver diskette **Intel IAA RAID Driver For ICH8R** into drive A: and press <Enter>.



Important

Please follow the instruction below to make an "Intel IAA RAID Driver For ICH8R (NH82801GR)" for yourself.

1. Insert the MSI CD into the CD-ROM drive.
2. Click the "Browse CD" on the Setup screen.
3. Copy all the contents in \\IDE\\Intel\\ICH8R\\Floppy to a formatted floppy diskette.
4. The driver diskette for **Intel® ICH8R RAID Controller** is done.

4. Choose the driver **Intel(R) ICH8R SATA RAID Controller** from the drop-down list that appears on Windows XP Setup screen, and press the <Enter> key.
5. Press <Enter> to continue with installation or if you need to specify any additional devices to be installed, do so at this time. Once all devices are specified, press <Enter> to continue with installation.
6. From the Windows XP/2000 Setup screen, press the <Enter> key. Setup will now load all device files and then continue the Windows XP/2000 installation.

† Existing Windows XP/2000 Driver Installation

1. Insert the MSI CD into the CD-ROM drive.
2. The CD will auto-run and the setup screen will appear.
3. Under the Driver tab, click on **Intel IAA RAID Edition**.
4. The drivers will be automatically installed.

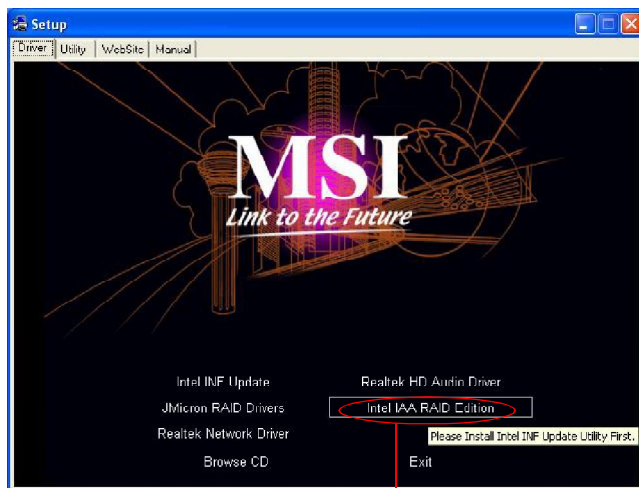
† Confirming Windows XP/2000 Driver Installation

1. From Windows XP/2000, open the **Control Panel** from **My Computer** followed by the System icon.
2. Choose the **Hardware** tab, then click the **Device Manager** tab.
3. Click the "+" in front of the **SCSI and RAID Controllers** hardware type. The driver **Intel(R) ICH8R SATA RAID Controller** should appear.

Installation of Intel Matrix Storage Console

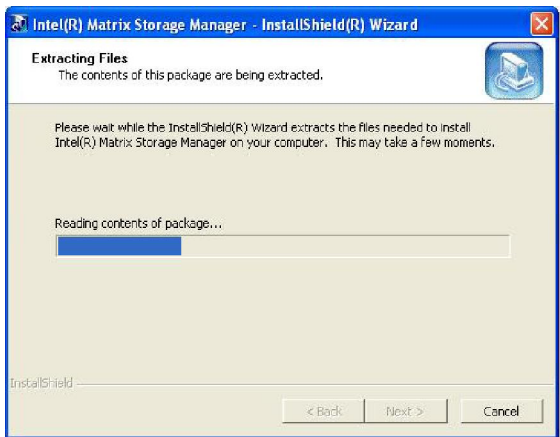
The Intel Application Accelerator RAID Edition driver may be used to operate the hard drive from which the system is booting or a hard drive that contains important data. For this reason, you cannot remove or un-install this driver from the system after installation; however, you will have the ability to un-install all other non-driver components.

Insert the MSI CD and click on the **Intel IAA RAID Edition** to install the software.

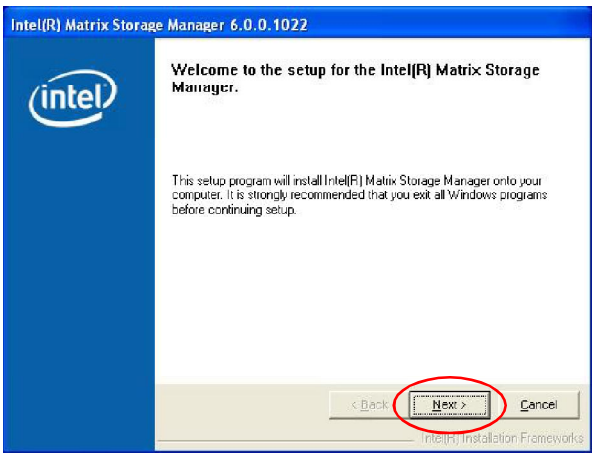


Click on this item

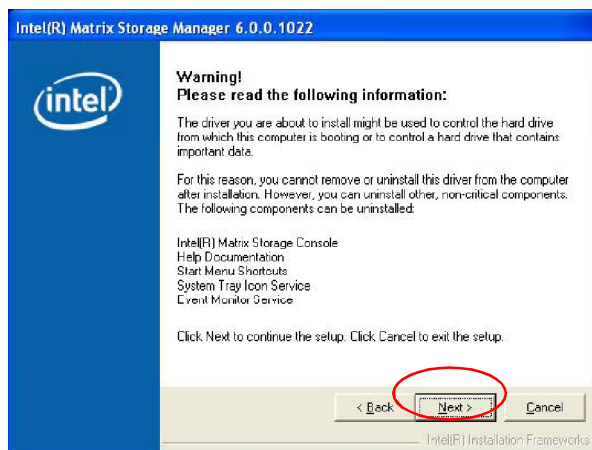
The **InstallShield Wizard** will begin automatically for installation showed as following:



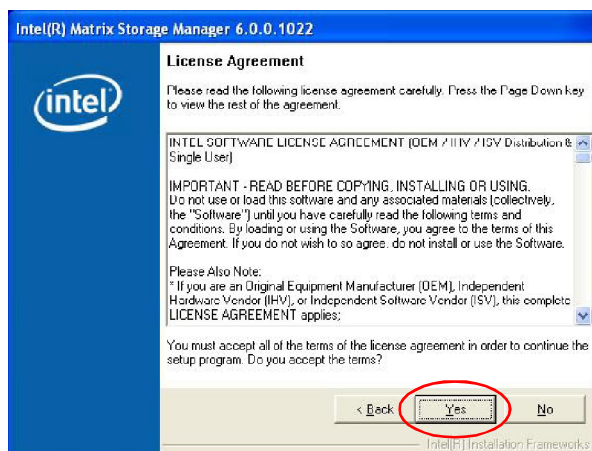
Click on the **Next** button to proceed the installation in the welcoming window.



The window shows the components to be installed. Click **Next** button to continue.



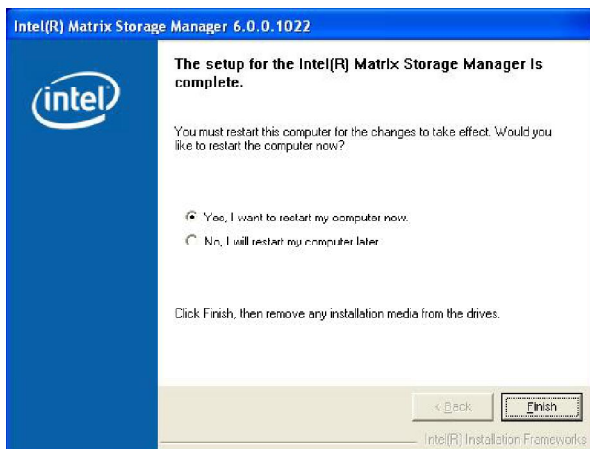
After reading the license agreement in the following window, click **Yes** button to continue.



The following window appears to show the Readme File Information. It shows the system requirements and installation information.



Once the installation is complete, the following window appears.



RAID Migration Instructions

The Intel Matrix Storage Console offers the flexibility to upgrade from a single Serial ATA (SATA) hard drive to RAID configuration when an additional SATA hard drive is added to the system. This process will create a new RAID volume from an existing disk. However, several important steps must be followed at the time the system is first configured in order to take advantage of RAID when upgrading to a second SATA hard drive:

1. BIOS must be configured for RAID before installing Windows XP on the single SATA hard drive. Refer to **On-Chip ATA Devices** for properly setting of the BIOS.
2. Install the Intel Application Accelerator RAID Driver during Windows Setup. Refer to **Installing Software** for instructions on installing the driver during Windows Setup.
3. Install the Intel Matrix Storage Console after the operating system is installed.

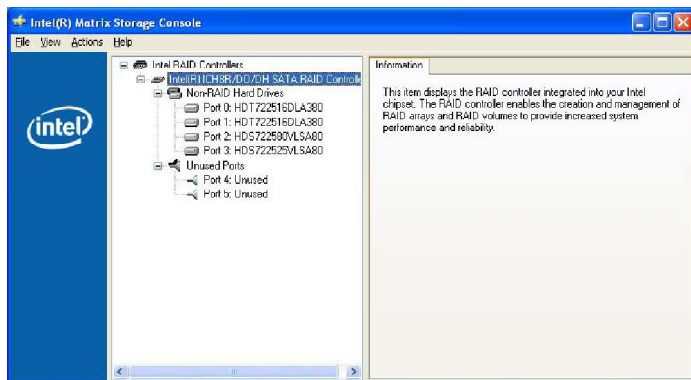
To create a volume from an existing disk, complete the following steps:



Important

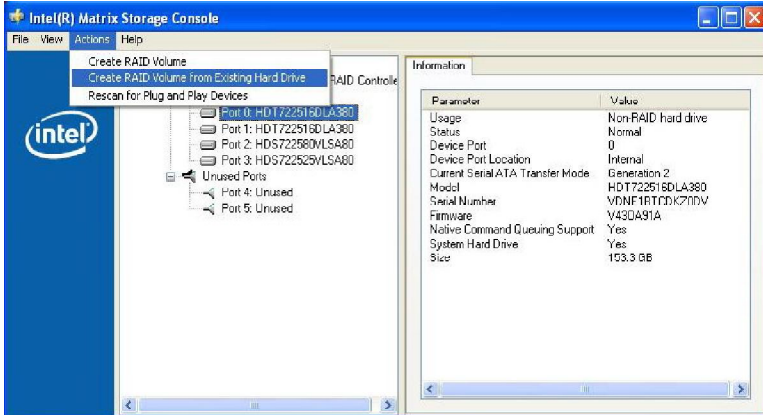
*A **Create from Existing Disk** operation will delete all existing data from the added disk and the data cannot be recovered. It is critical to backup all important data on the added disk before proceeding. However, during the migration process, the data on the source disk is preserved.*

After the Intel Matrix Storage Console has been successfully installed and the system has rebooted, click on the Intel Application Accelerator shortcut link (**Start --> All Programs --> Intel Matrix Storage Manager --> Intel Matrix Storage Console**) and the following window will appear:

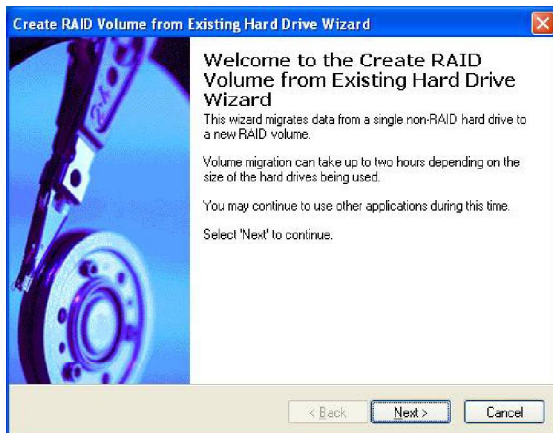


Create RAID Volume from Existing Disk

To create a RAID volume from an existing disk, choose **Action --> Create RAID Volume from Existing Hard Drive**.

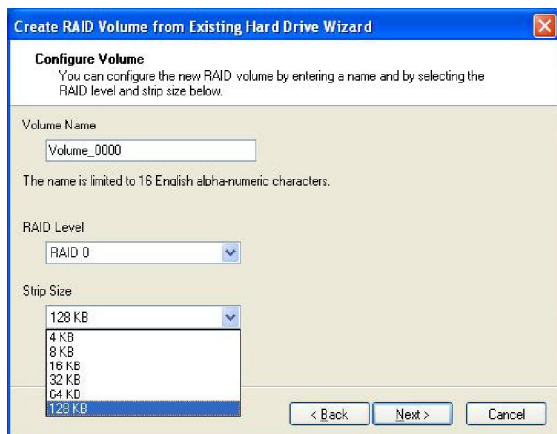


The **Create RAID Volume from Existing Hard Drive Wizard** pops up to lead you for the following procedure. Click **Next** to continue.



(1) Step 1: Configure Volume

Here you can configure the new RAID volume by entering the volume name, selecting the RAID level and strip size.



† RAID Volume Name:

A desired RAID volume name needs to be typed in where the 'RAID_Volume1' text currently appears above. The RAID volume name has a maximum limit of 16 characters. The RAID volume name must also be in English alphanumeric ASCII characters.

† RAID Level:

Select the desired RAID level:

RAID 0 (Performance) – A volume optimized for performance will allow you to access your data more quickly.

RAID 1 (Redundancy) – A volume optimized for data redundancy will provide you with a realtime duplicate copy of your data. Note: Only half of the available volume space will be available for data storage.

RAID 5 (Useful) – RAID 5 can be used on three or more disks, with zero or more spare-disks. The resulting RAID-5 device size will be $(N-1)*S$, where N is the how many drive, S is the size of the smallest drive in the array. If one of the disks fail, all data are still intact. It can rebuild the disk from the parity information. If spare disks are available, reconstruction will begin immediately after the device failure. If two disks fail simultaneously, all data are lost. RAID-5 can survive one disk failure, but not two or more. Both read and write performance usually increase, but can be hard to predict how much. Reads are similar to RAID-0 reads, writes can be either rather

expensive (requiring read-in prior to write, in order to be able to calculate the correct parity information), or similar to RAID-1 writes. The write efficiency depends heavily on the amount of memory in the machine, and the usage pattern of the array. Heavily scattered writes are bound to be more expensive.

RAID 10 (Mirrored Stripes) – A RAID 1 array of two RAID 0 arrays.

† **Strip Sizes:**

Select the desired strip size setting. As indicated, the optimal setting is 128KB. Selecting any other option may result in performance degradation. Even though 128KB is the recommended setting for most users, you should choose the strip size value which is best suited to your specific RAID usage model. The most typical strip size settings are:

4KB: For specialized usage models requiring 4KB strips

8KB: For specialized usage models requiring 8KB strips

16KB: Best for sequential transfers

32KB: Good for sequential transfers

64KB: Good general purpose strip size

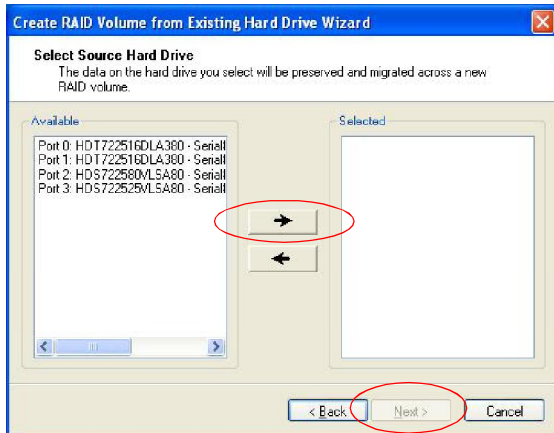
128KB: Best performance for most desktops and workstations

(2) Select the source disk

Then select the source disk that you wish to use and then click “--->” to move it to the **Selected** field. Then click **Next** to continue.

It is very important to note which disk is the source disk (the one containing all of the information to be migrated) and which one is the target disk. On a RAID Ready system, this can be determined by making a note during POST of which port the single disk is attached to.

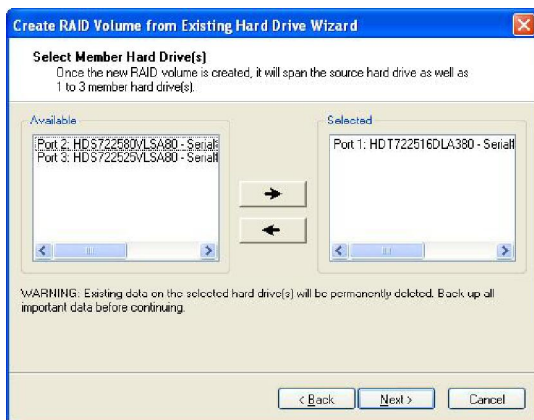
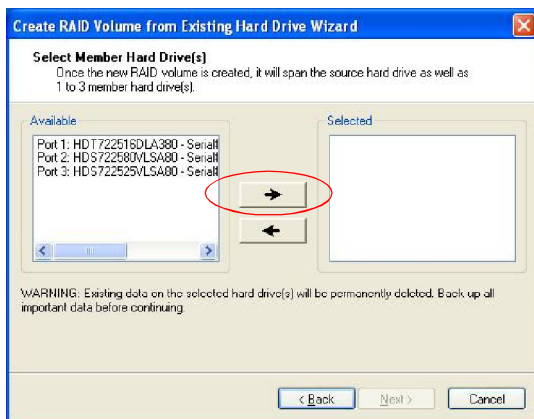
You can also use the Intel Application Accelerator RAID Edition utility before the second disk is installed to verify the Port and serial number of the drive that contains all the data.



(3) Select Member Hard Drive(s)

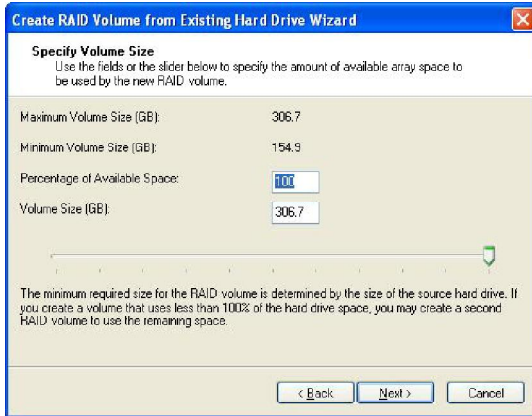
Then select the member disk (the target disk) that you wish to use and then click “-->” to move it to the **Selected** field. Then click **Next** to continue.

Please note that the existing data on the selected hard drive(s) will be deleted permanently. Do not forget to back up all the important data before continuing.



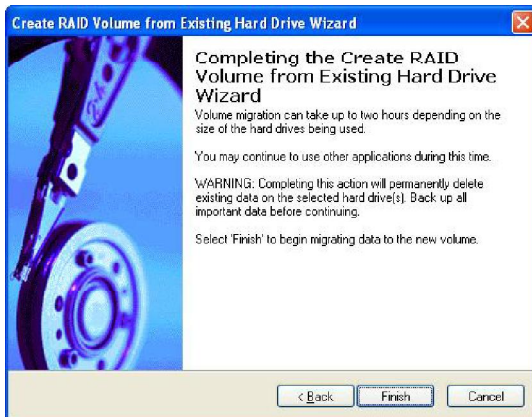
(4) Specify Volume Size

Specify the amount of available array space to be used by the new RAID volume. You may enter the amount in the space or use the slider to specify. It is recommended you use 100% of the available space for the optimized usage. For RAID 0 volume, if you do not specify 100% of the hard drive space, the rest hard drive space will be worked as RAID 1 volume, which is the new technology called Intel Matrix RAID. Then click **Next** to continue.



(5) Start Creating RAID Volume from Existing Hard Drive Wizard

Before you continue the procedure of RAID volume creation from existing hard drive, read the dialogue box below carefully. Please note that once you click **Finish**, the existing data on the selected hard drive(s) will be deleted permanently and this operation cannot be undone. It is critical that you backup all important data before selecting **Finish** to start the migration process.



(6) Start Migration

The migration process may take up to two hours to complete depending on the size of the disks being used and the strip size selected. A dialogue window will appear stating that the migration process may take considerable time to complete, meanwhile a popup dialogue at the taskbar will also show the migration status. While you can still continue using your computer during the migration process, once the migration process starts, it cannot be stopped. If the migration process gets interrupted and your system is rebooted for any reason, it will pick up the migration process where it left off. You will be provided with an estimated completion time (the remaining time will depend on your system) once the migration process starts.



The following screen appears if the migration process is completed successfully. Then you have to reboot your system to use the full capacity of the new volume.



Degraded RAID Array

A RAID 1, RAID 5 or RAID 10 volume is reported as degraded when one of its hard drive members fails or is temporarily disconnected, and data mirroring is lost. As a result, the system can only utilize the remaining functional hard drive member. To re-establish data mirroring and restore data redundancy, refer to the procedure below that corresponds to the current situation.

Missing Hard Drive Member

1. Make sure the system is powered off.
2. Reconnect the hard drive.
3. Reboot the system to Windows; the rebuild will occur automatically.

Failed Hard Drive Member

1. Make sure the system is powered off.
2. Replace the failed hard drive with a new one that is of equal or greater capacity.
3. Reboot the system to Intel RAID Option ROM by press <Ctrl> and <I> keys simultaneously during the Power-On Self Test (POST).

```
Intel(R) Matrix Storage Manager option ROM v6.0.0.1017 ICH8R wRAID5
Copyright(C) 2003-06 Intel Corporation. All Rights Reserved.

RAID Volumes
ID Name Level Strip Size Status Bootable
0 Volume0 RAID10(RAID0+1) 64KB 153.4GB Degraded Yes

Physical Disks::
Port Device Model Serial # Size Type/Status(Vol ID)
0 HDS722580VLSA80 VNRB3EC20549SL 76.7GB Member Disk (0)
1 HDS722580VLSA80 VNRB3EC20569SL 76.7GB Member Disk (0)
2 HDS722580VLSA80 VNRB3EC20569SL 76.7GB Member Disk (0)
3 HDS722580VLSA80 VNRB3EC20569SL 76.7GB Non-RAID Disk

Press <CTRL-I> to enter Configuration Utility..
```

4. Select the port of the destination disk for rebuilding, and then press ENTER.

```
Intel(R) Matrix Storage Manager option ROM v6.0.0.1017 ICH8R wRAID5
Copyright(C) 2003-06 Intel Corporation. All Rights Reserved.

[ MAIN MENU ]

[ DEGRADED VOLUME DETECTED ]

Degraded volume and disk available for rebuilding detected. Selecting
a disk initiates a rebuild. Rebuild completes in the operating system.

Select the port of the destination disk for rebuilding (ESC to exit):

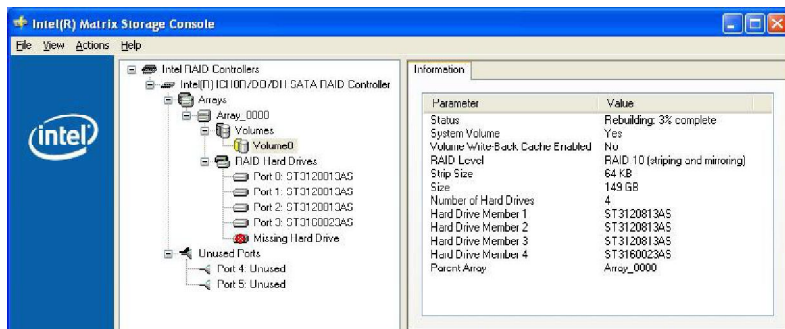
Port Drive Model Serial # Size
0 HDS722580VLSA80 VNRB3EC20549SL 76.7GB

[ ↑ ↓ ]-Previous/Next [ENTER]-Select [ESC]-Exit

Port Device Model Serial # Size Type/Status(Vol ID)
0 HDS722580VLSA80 VNRB3EC20549SL 76.7GB Member Disk (0)
1 HDS722580VLSA80 VNRB3EC20569SL 76.7GB Member Disk (0)
2 HDS722580VLSA80 VNRB3EC20569SL 76.7GB Member Disk (0)
3 HDS722580VLSA80 VNRB3EC20579SL 76.7GB Non-RAID Disk

[ ↑ ↓ ]Change [ESC]-Previous Menu [ENTER]-Select
```

5. Exit Intel RAID Option ROM, and then reboot to Windows system.
6. When prompted to rebuild the RAID volume, click 'Yes'.
7. The Intel(R) Storage Utility will be launched. Right-click the new hard drive and select 'Rebuild to this Disk'. The 'Rebuild Wizard' will be launched which will guide you through the process of rebuilding to the new hard drive.



Appendix D

JMicron RAID Introduction

JMicron's RAID provides Serial ATA RAID 0 (Striping) , RAID 1 (Mirroring) and JBOD functionality to enhance the industry's leading PCI Express-to-SATA & PATA host controller products. Two major challenges facing the storage industry today are (1): keeping pace with the increasing performance demands of computer systems by improving disk I/O throughput, and (2): providing data accessibility in the face of hard disk failures while utilizing full disk capacity. JMicron PCI Express-to-SATA/ PATA provide 1 SATA port and 1 PATA port with RAID to solve both of these problems.

Introduction

RAID - Redundant Array of Independent Disks

RAID technology manages multiple disk drives to enhance I/O performance and provide redundancy in order to withstand the failure of any individual member, without loss of data. RAID provides two RAID Set types, Striping (RAID 0) and Mirroring (RAID 1).

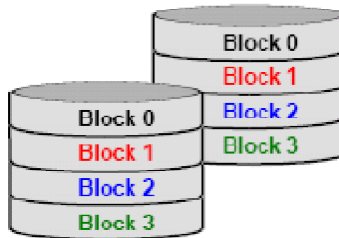
RAID 0 (Striping)

Striping is a performance-oriented, non-redundant data mapping technique. While Striping is discussed as a RAID Set type, it actually does not provide fault tolerance. Striping arrays use multiple disks to form a larger virtual disk.



RAID 1 (Mirroring)

Disk mirroring creates an identical twin for a selected disk by having the data simultaneously written to two disks. This redundancy provides instantaneous protection from a single disk failure. If a read failure occurs on one drive, the system reads the data from the other drive.



JBOD (Concatenate)

JBOD provides a method for combining drives of different sizes into one large disk



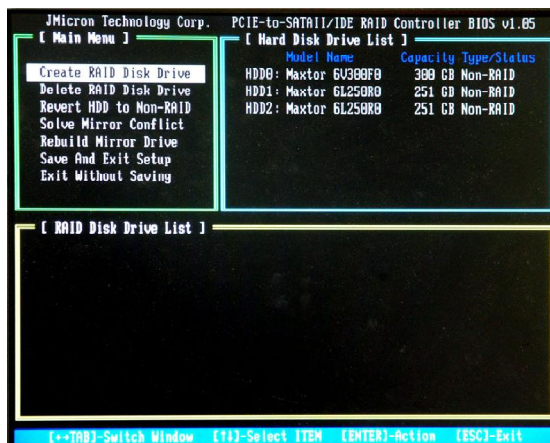
Important

All the information/pictures illustrations in this chapter might differ from the listed in your system.

Creating and Deleting RAID sets with BIOS Utility

Be sure to set **[Enabled]** for the **Onboard RAID Control** of **Integrated Peripherals** in BIOS before configuring the JMicron BIOS utility. After that press F10 to save the configuration and exit. During boot up (POST), press CTRL+J to enter the JMicron RAID BIOS Menu.

The RAID Utility menu screen will be displayed. A brief description of each section is presented below.



Main Menu

The Main Menu in the upper left corner is used to choose the operation to be performed. The selections are:

Create RAID set - is used to create a new legacy RAID set.

Delete RAID set - is used to delete a legacy RAID set.

Revert HDD to non-RAID - is used to revert an existed-RAID HDD to non-RAID.

Solve Mirror Conflict - is used to solve the conflict in RAID 1.

Rebuild Mirror Drive - is used to rebuild any rebuildable mirror drive.

Save And Exit Setup - save all settings and exit the BIOS utility.

Exit Without Saving - exit the BIOS utility without any saving.

Hard Disk Driver List

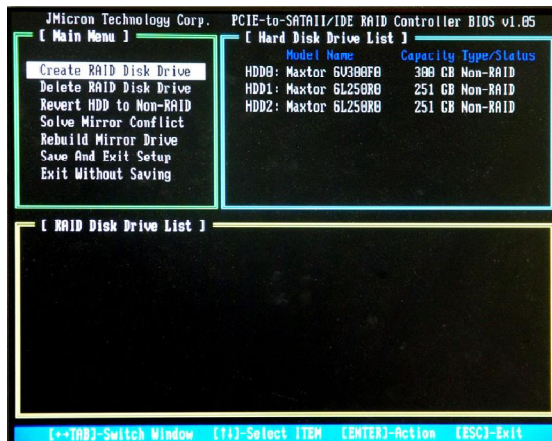
The menu shows the model number and capacities of the drives physically attached to the SATAII & PATA ports.

RAID Disk Driver List

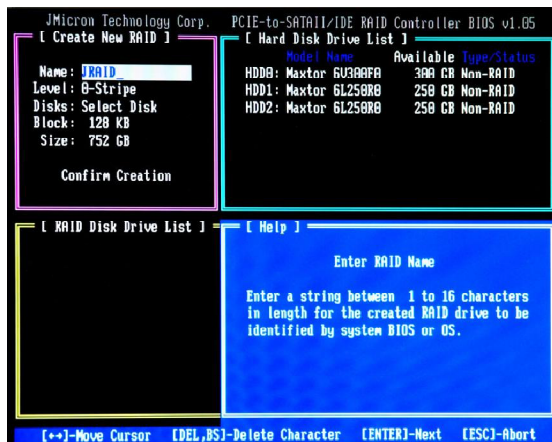
The menu shows the current configuration of RAID set.

Creating RAID set

1. Select "Create RAID Disk Drive". Then press <Enter>.



2. Then in the **Name** field, specify a RAID set name and then press the <Enter> to go to the next field.

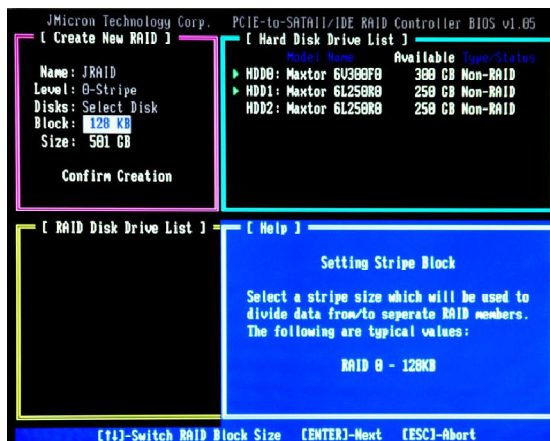


3. Choose a 0-Striped, a 1-Mirror, or a JBOD-Concatenate combination set and then press <Enter> to go to the next step.

4. In the **Hard Disk Disk List** menu, use <Space> key to select the disks you want to create for the RAID set, then click <Enter> key to finish selection.

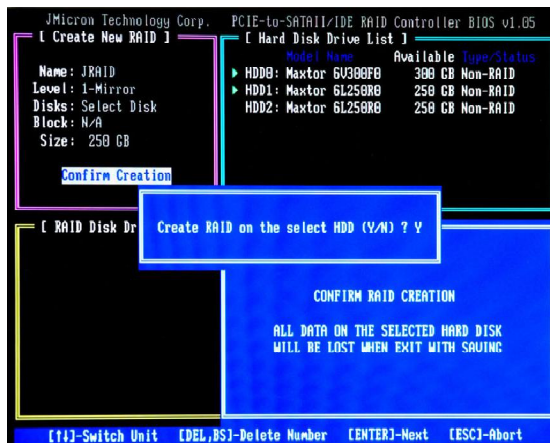


5. Then select the stripe value for the RAID array by using the “upper arrow” or “down arrow” keys to scroll through the available values, and pressing the <Enter> key to select and advance to the next field. The available values range from 4KB to 128 KB. The default and typical value for RAID 0 is 128KB. (This field only available for RAID 0 mode.)

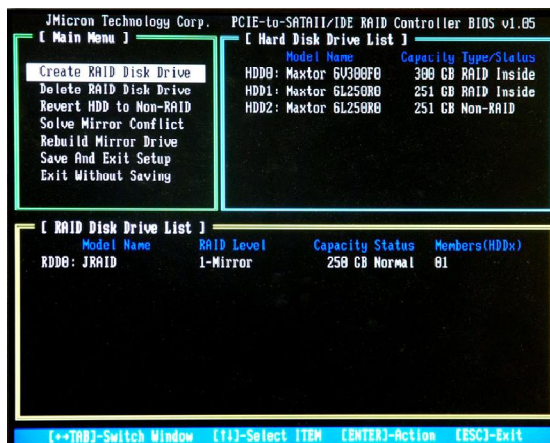


6. Then select the capacity of the RAID set in the **Size** field. The default value is the maximum capacity of the selected disks. Then press <Enter> to the Confirm Creation field.

7. The Creation field will display a message to ask you to confirm the creation. Then press <Y> key to proceed with the RAID set creation.



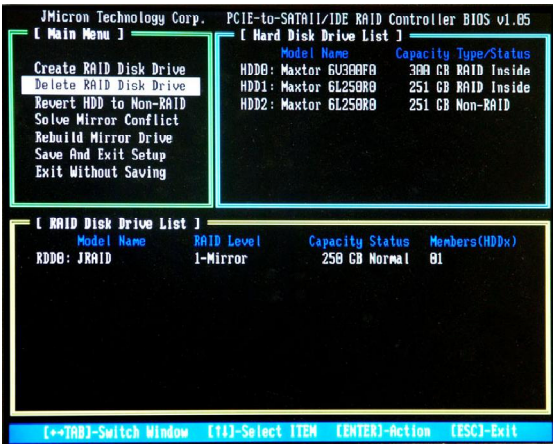
8. Then the following screen appears to indicate that the creation is finished.



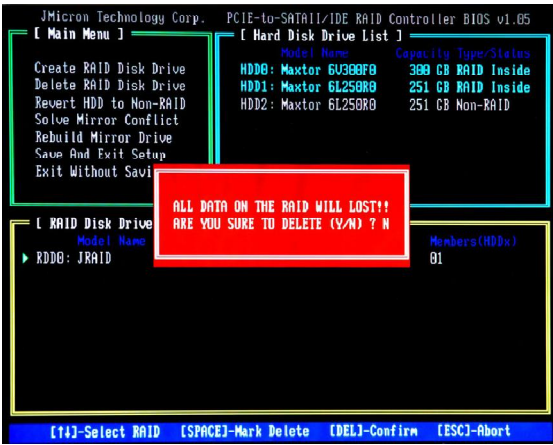
8. Go to the Save And Exit Setup field and press <Enter>, a message will display to ask you to confirm the setup. Then press <Y> key to save the setting and exit the BIOS utility.

Deleting RAID set

1. Select “Delete RAID Disk Drive”. Then press <Enter>.

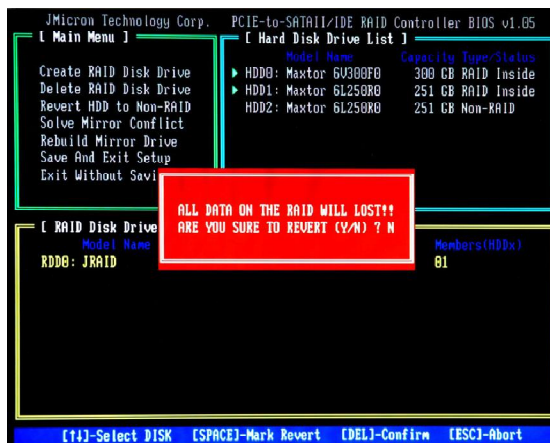


2. In the RAID Disk Driver List menu, use <Space> key to select the RAID set you want to delete. Then press key.
3. Press “Y” to accept the deletion when a deletion message is appeared.



Revert HDD to non-RAID

Select **Revert HDD to non-RAID** and press <Enter>. In the Hard Disk Driver List menu use <Space> key to select the disks you want to revert then click <Enter> key. The following screen appears, press <Y> key to remove any RAID structures from the drives.

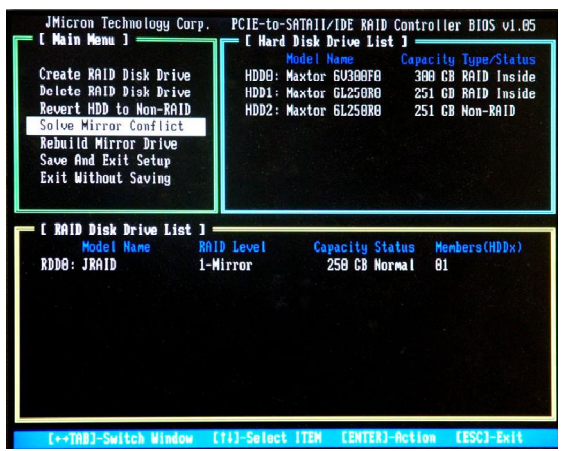


Important

1. You will lose all data on the RAID drives and any internal RAID structures when you perform this operation.
2. Possible reasons to 'Revert HDD to non-RAID' could include issues such as incompatible RAID configurations or a failed volume or failed disk.

Slove Mirror Conflict

When your mirror raid drive has lost each other, it means that both of the members ever be identify by the Option ROM at different boot. The members will both think itself as source disk. So that the System can not decide which one is source disk, the user can not access this raid drive. In such example, the Option ROM gives users an method to solve this problem. It allow users to choose one of the members of Mirror drive as source disk. And then users can try to rebuild the Mirror drive according to the content of chosen one.



Rebuild Mirror Drive

This option will help users to rebuild any Rebuildable Mirror drive. The bottom of the window will show the achieved percentage of scheduled progress.

Installing the RAID Driver (For bootable RAID array)

Install Driver in Windows XP / 2000

† New Windows XP / 2000 Installation

The following details the installation of the drivers while installing Windows XP / 2000.

1. Start the installation:
Boot from the CD-ROM. Press F6 when the message "Press F6 if you need to install third party SCSI or RAID driver" appears.
2. When the Windows XP/2000 Setup window is generated, press <S> key to specify an Additional Device(s).
3. Insert the driver diskette **JMicron RAID Driver** into drive A: and press <Enter>.



Important

The JMicron RAID Driver Installation Disk should be accompanied in the mainboard package. You may make the Serial ATA RAID driver by yourself by following the instruction below.

1. Insert the MSI CD into the CD-ROM drive.
2. Click the "Browse CD" button on the Setup Screen.
3. Copy all the contents in the `\\DE \\ JMicron \\ Floppy` to a formatted floppy disk.
4. The driver disk for **JMicron RAID Controller** is done.

4. Choose the driver **JMicron JMB36X RAID Controller** that appears on Windows XP/2000 Setup screen, and press the <Enter> key.
5. Press <Enter> to continue with installation or if you need to specify any additional devices to be installed, do so at this time. Once all devices are specified, press <Enter> to continue with installation.
6. From the Windows XP/2000 Setup screen, press the <Enter> key. Setup will now load all device files and then continue the Windows XP/2000 installation.

† Installing OS on RAID Drive

1. After setup examines your disks, it will copy files to Windows installation folders and restart the system.
2. The setup program will continue and finish the installation after restarting.
3. Wait until Windows XP/2000 finishes installing devices, regional settings, networking settings, components, and final set of tasks, then reboot the system if necessary.

† Confirming Windows XP/2000 Driver Installation

1. From Windows XP/2000, open the **Control Panel** from **My Computer** followed by the System icon.
2. Choose the **Hardware** tab, then click the **Device Manager** tab.
3. Click the "+" in front of the **SCSI and RAID Controllers** hardware type. The driver **JMicron JMB36X RAID Controller** should appear.

JMicron Raid Configurer

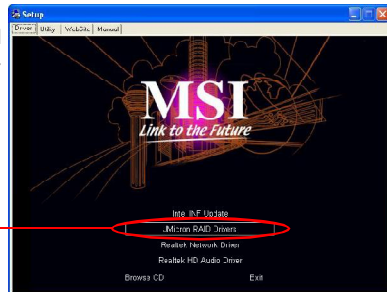
There is an application called JMicron Raid Configurer which helps you perform the following tasks of nVidia RAID.

- **Viewing RAID Array Configurations**
View an array configuration (mirrored, striped)
- **Create RAID**
- **Create RAID From Existing Disk**
- **Deleting a RAID Array**


Installing JMicron Raid Configurer

Before use the **JMicron Raid Configurer**, you have to install it. Insert the MSI CD and click on the **JMicron RAID Drivers** to install the software.

click **JMicron RAID Drivers**



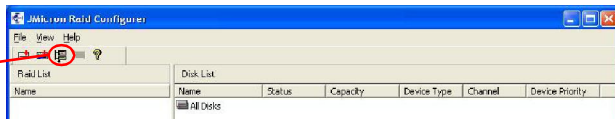
Viewing RAID Array Configurations

To view your RAID configuration from Windows, launch the JMicron Raid Configurer utility by clicking the icon  from the system tray at the lower-right corner of the screen.



Left-click the "Show Disks" button and the information of all hard disks will display on the right side of the window.

click this button



Important

The information in the figures in this part may vary from what it is shown in your system.

Creating RAID/ Creating RAID from Existing Disk

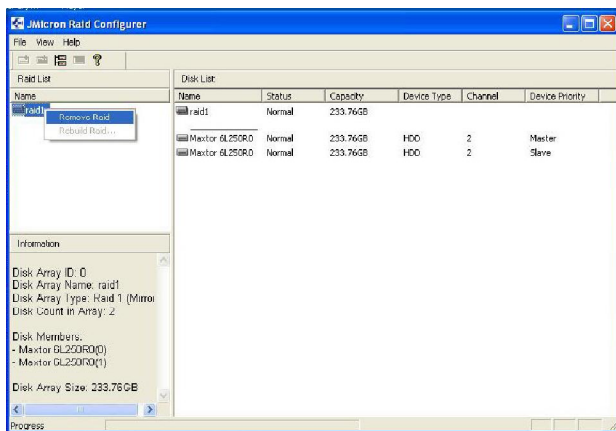
JMRaidTool supports the creation of RAID 0/ RAID 1/ JBOD .

1. Left-click the “Create RAID”/ “Create RAID from Existing Disk” button.
2. A wizard dialogue will display on the screen, following the description of every step to complete the creation.



Deleting RAID

1. Right-click the name of the disk array you want to delete and the “Remove” menu will appear.



2. A warning message appears to remind you that the data will be lost. Press the “Yes” button if you really want to delete the disk array.

Appendix E

Realtek ALC883 Audio

The Realtek ALC883 provides 10-channel DAC that simultaneously supports 7.1 sound playback and 2 channels of independent stereo sound output (multiple streaming) through the Front-Out-Left and Front-Out-Right channels.

Installing the Realtek HD Audio Driver

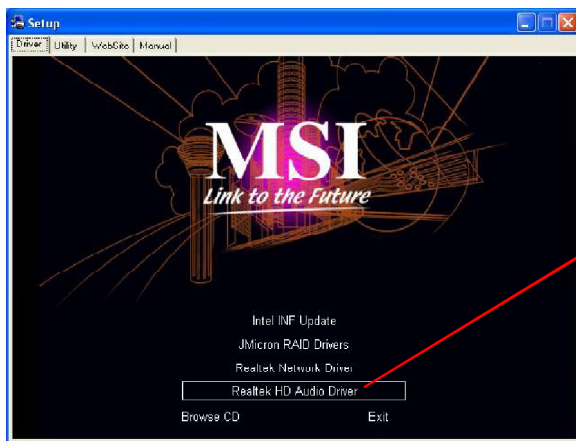
You need to install the driver for Realtek ALC883 codec to function properly before you can get access to 2-, 4-, 6-, 8- channel or 7.1+2 channel audio operations. Follow the procedures described below to install the drivers for different operating systems.

Installation for Windows 2000/XP

For Windows® 2000, you must install Windows® 2000 Service Pack4 or later before installing the driver. For Windows® XP, you must install Windows® XP Service Pack1 or later before installing the driver.

The following illustrations are based on Windows® XP environment and could look slightly different if you install the drivers in different operating systems.


1. Insert the application CD into the CD-ROM drive. The setup screen will automatically appear.
2. Click **Realtek HD Audio Driver**.



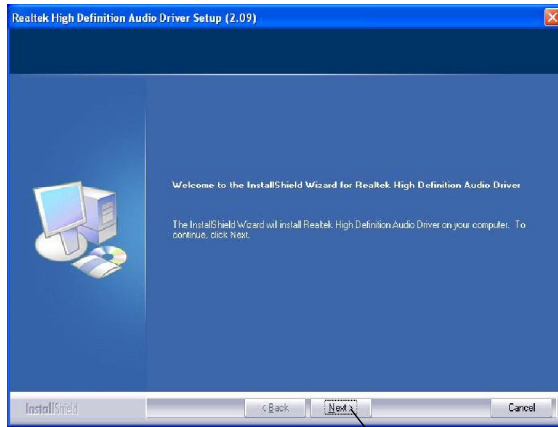
Click here



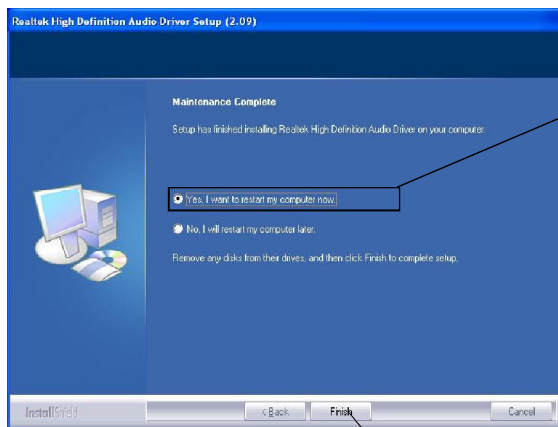
Important

The HD Audio Configuration  software utility is under continuous update to enhance audio applications. Hence, the program screens shown here in this section may be slightly different from the latest software utility and shall be held for reference only.


3. Click **Next** to install the Realtek High Definition Audio Driver.



4. Click **Finish** to restart the system.

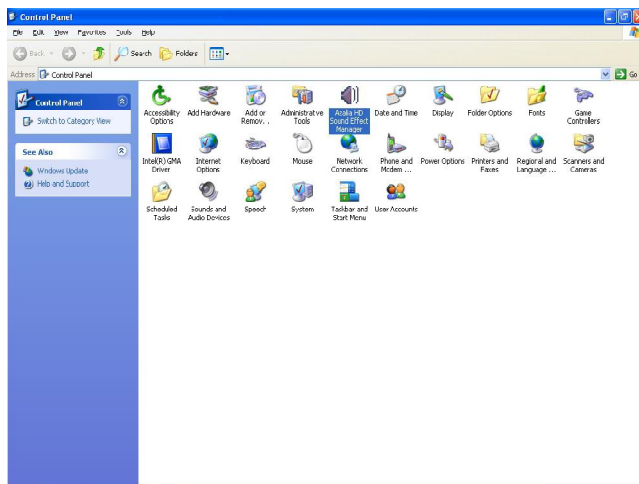


Software Configuration

After installing the audio driver, you are able to use the 2-, 4-, 6- or 8- channel audio feature now. Click the audio icon  from the system tray at the lower-right corner of the screen to activate the **HD Audio Configuration**. It is also available to enable the audio driver by clicking the **Azalia HD Sound Effect Manager** from the **Control Panel**.

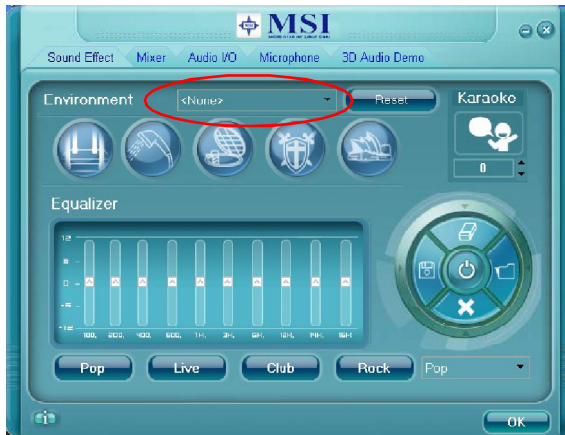


Double click



Sound Effect

Here you can select a sound effect you like from the **Environment** list.



Environment Simulation

You will be able to enjoy different sound experience by pulling down the arrow, totally 23 kinds of sound effect will be shown for selection. Realtek HD Audio Sound Manager also provides five popular settings “Stone Corridor”, “Bathroom”, “Sewer pipe”, “Arena” and “Audio Corridor” for quick enjoyment.

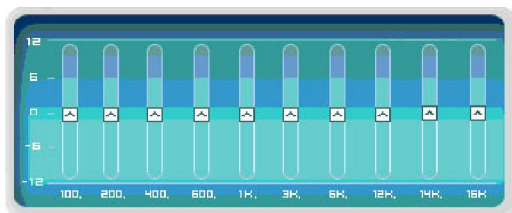
You may choose the provided sound effects, and the equalizer will adjust automatically. If you like, you may also load an equalizer setting or make an new equalizer setting to save as an new one by using the “**Load EQ Setting**” and “**Save Preset**” button, click “**Reset EQ Setting**” button to use the default value, or click “**Delete EQ Setting**” button to remove a preset EQ setting.

There are also other pre-set equalizer models for you to choose by clicking “**Others**” under the **Equalizer** part.

Equalizer Selection

Equalizer frees users from default settings; users may create their own preferred settings by utilizing this tool.

10 bands of equalizer, ranging from 100Hz to 16KHz.



Save

The settings are saved permanently for future use

Reset

10 bands of equalizer would go back to the default setting

Enable / Disable

To disable, you can temporarily stop the sound effect without losing the settings

Load

Whenever you would like to use preload settings, simply click this, the whole list will be shown for your selection.

Delete

To delete the pre-saved settings which are created from previous steps.



Frequently Used Equalizer Setting

Realtek recognizes the needs that you might have. By leveraging our long experience at audio field, Realtek HD Audio Sound Manager provides you certain optimized equalizer settings that are frequently used for your quick enjoyment.

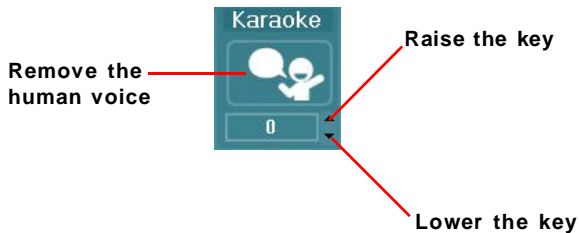
[How to Use It]

Other than the buttons “Pop” “Live” “Club” & “Rock” shown on the page, to pull down the arrow in “Others”, you will find more optimized settings available to you.

Karaoke Mode

Karaoke mode brings Karaoke fun back home. Simply using the music you usually play, Karaoke mode can help you eliminate the vocal of the song or adjust the key to accommodate your range.

- 1.Vocal Cancellation: Single click on “Voice Cancellation”, the vocal of the song would be eliminated, while the background music is still in place, and you can be that singer!
- 2.Key Adjustment: Using “Up / Down Arrow” to find a key which better fits your vocal range.



Mixer

In the **Mixer** part, you may adjust the volumes of the rear and front panels individually.

1. Adjust Volume

You can adjust the volume of the speakers that you plugged in front or rear panel.




Important

Before set up, please make sure the playback devices are well plugged in the jacks on the rear or front panel.

2. Multi-Stream Function

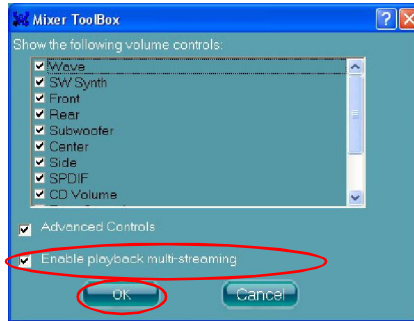
ALC883 supports an outstanding feature called Multi-Stream, which means you may play different audio sources simultaneously and let them output respectively from the indicated rear panel or front panel. This feature is very helpful when 2 people are using the same computer together for different purposes.

Click the  button and the Mixer **ToolBox** menu will appear. Then check the **Enable playback multi-streaming** and click **OK** to save the setup.



Important

You have to plug the device into the jacks on the rear and front panel first before enable the multi-stream function.



When you are playing the first audio source (for example: use Windows Media Player to play DVD/VCD), the output will be played from the rear panel, which is the default setting.

Then you **must** to select the **Realtek HD Audio 2nd output** from the scroll list **first**, and use a different program to play the second audio source (for example: use Winamp to play MP3 files). You will find that the second audio source (MP3 music) will come out from the Line-Out audio jack of Front Panel.



3. Playback control



Tool

Mute

Playback device

This function is to let you freely decide which ports to output the sound. And this is essential when multi-streaming playback enabled.

- Realtek HD Audio Output
- Realtek HD Audio 2nd Output

Mute

You may choose to mute single or multiple volume controls or to completely mute sound output.

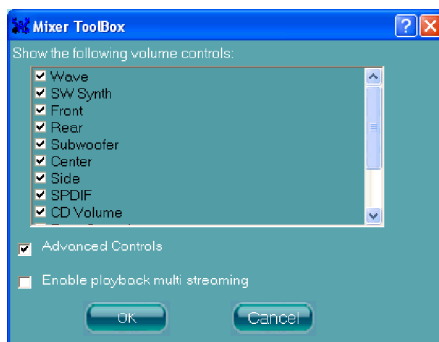
Tool

- Show the following volume controls

This is to let you freely decide which volume control items to be displayed.

- Advanced controls
- Enable playback multi-streaming

With this function, you will be able to have an audio chat with your friends via headphone (stream 1 from front panel) while still have music (stream 2 from back panel) in play. At any given period, you can have maximum 2 streams operating simultaneously.



4. Recording control



Mute

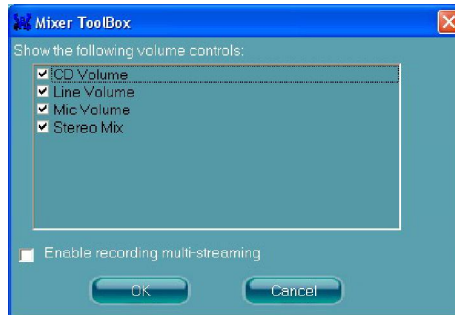
You may choose to mute single or multiple volume controls or to completely mute sound input.

Tool

- Show the following volume controls

This is to let you freely decide which volume control items to be displayed.

- Enable recording multi-streaming



Important

ALC883 allows you to record the CD, Line, Mic and Stereo Mix channels simultaneously, frees you from mixing efforts. At any given period, you may choose 1 of the following 4 channels to record.

Audio I/O

In this tab, you can easily configure your multi-channel audio function and speakers. You can choose a desired multi-channel operation here.


- a. **Headphone** for the common headphone
- b. **2CH Speaker** for Stereo-Speaker Output
- c. **4CH Speaker** for 4-Speaker Output
- d. **6CH Speaker** for 5.1-Speaker Output
- e. **8CH Speaker** for 7.1-Speaker Output



Speaker Configuration:

1. Plug the speakers in the corresponding jack.
2. Dialogue "connected device" will pop up for your selection. Please select the device you have plugged in.
 - If the device is being plugged into the correct jack, you will be able to find the icon beside the jack changed to the one that is same as your device.
 - If not correct, Realtek HD Audio Manager will guide you to plug the device into the correct jack.

Connector Settings

Click  to access connector settings.



Disable front panel jack detection (option)

Jack detection function only works with HD audio front panel.

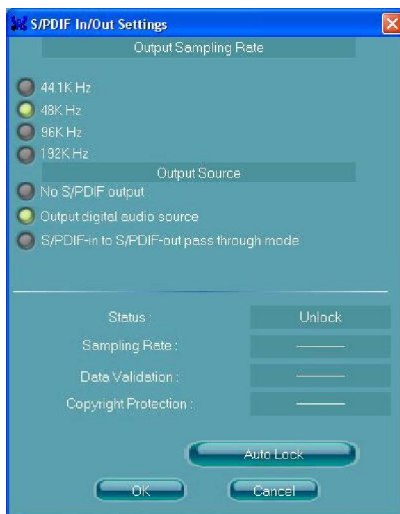
Mute rear panel output when front headphone plugged in.

Enable auto popup dialogue, when device has been plugged in

Once this item checked, the dialog "Connected device" would automatically pop up when device plugged in.

S/PDIF

Short for Sony/Philips Digital Interface, a standard audio file transfer format. S/PDIF allows the transfer of digital audio signals from one device to another without having to be converted first to an analog format. Maintaining the viability of a digital signal prevents the quality of the signal from degrading when it is converted to analog.

**Output Sampling Rate**

44.1KHz: This is recommend while playing CD.

48KHz: This is recommended while playing DVD or Dolby.

96KHz: This is recommended while playing DVD-Audio.

192KHz: This is recommended while playing High quality Audio.


Output Source

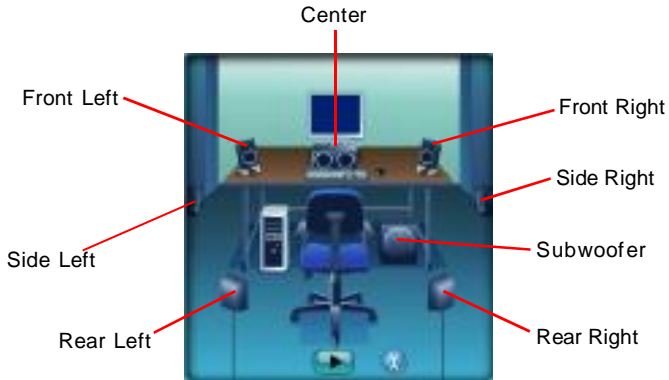
No S/PDIF out: There will no S/PDIF out.

Output digital audio source: The digital audio format (such as .wav, .mp3,.midi etc) will come out through S/PDIF-Out.

S/PDIF-in to S/PDIF -out pass though mode: The data from S/PDIF-In can be real-time played from S/PDIF-Out.

Test Speakers

You can select the speaker by clicking it to test its functionality. The one you select will light up and make testing sound. If any speaker fails to make sound, then check whether the cable is inserted firmly to the connector or replace the bad speakers with good ones. Or you may click the **auto test**  button to test the sounds of each speaker automatically.



Microphone

In this tab you may set the function of the microphone. Select the **Noise Suppression** to remove the possible noise during recording, or select **Acoustic Echo Cancellation** to cancel the acoustic echo during recording.

Acoustic Echo Cancellation prevents playback sound from being recorded by microphone together with your sound. For example, you might have chance to use VOIP function through Internet with your friends. The voice of your friend will come out from speakers (playback). However, the voice of your friend might also be recorded into your microphone then go back to your friend through Internet. In that case, your friend will hear his/her own voice again. With AEC(Acoustic Echo Cancellation) enabled at your side, your friend can enjoy the benefit with less echo.



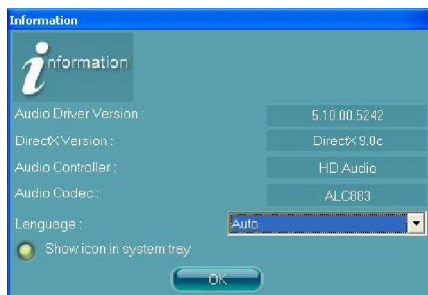
3D Audio Demo


In this tab you may adjust your 3D positional audio before playing 3D audio applications like gaming. You may also select different environment to choose the most suitable environment you like.



Information

In this tab it provides some information about this HD Audio Configuration utility, including Audio Driver Version, DirectX Version, Audio Controller & Audio Codec. You may also select the language of this utility by choosing from the **Language** list.



Also there is a selection **Show icon in system tray**. Switch it on and an icon  will show in the system tray. Right-click on the icon and the **Audio Accessories** dialogue box will appear which provides several multimedia features for you to take advantage of.



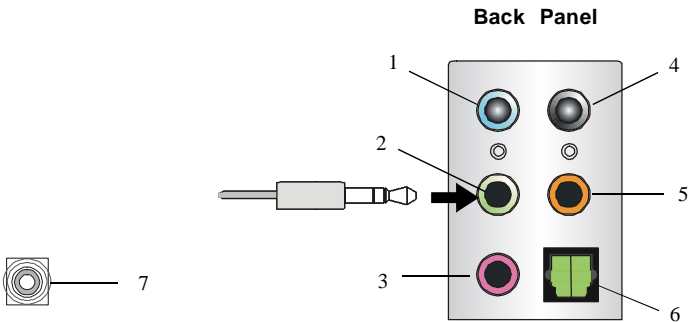
Hardware Setup

Connecting the Speakers

When you have set the Multi-Channel Audio Function mode properly in the software utility, connect your speakers to the correct phone jacks in accordance with the setting in software utility.

n 2-Channel Mode for Stereo-Speaker Output

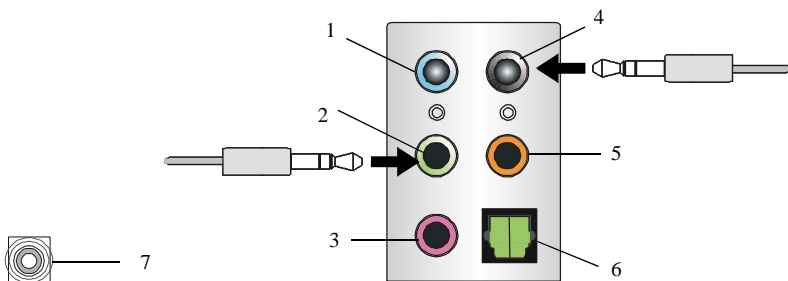
Refer to the following diagram and caption for the function of each phone jack on the back panel when 2-Channel Mode is selected.



- 1** Line In
- 2** Line Out (*Front channels*)
- 3** MIC
- 4** Line Out (*Rear channels, but no functioning in this mode*)
- 5** Line Out (*Center and Subwoofer channel, but no functioning in this mode*)
- 6** S/PDIF Out-Optical
- 7** S/PDIF Out-Coaxial

n 4-Channel Mode for 4-Speaker Output

Back Panel



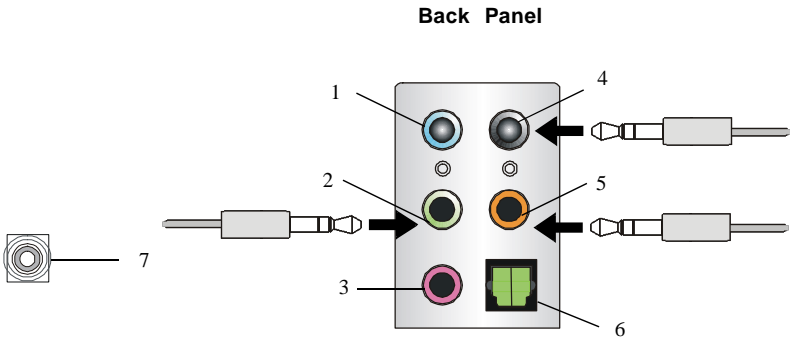
Description:

Connect two speakers to back panel's Line Out connector and two speakers to the real-channel Line Out connector.

4-Channel Analog Audio Output

- 1 Line In
- 2 Line Out (*Front channels*)
- 3 MIC
- 4 Line Out (*Rear channels*)
- 5 Line Out (*Center and Subwoofer channel, but no functioning in this mode*)
- 6 S/PDIF Out-Optical
- 7 S/PDIF Out-Coaxial

n 6-Channel Mode for 6-Speaker Output



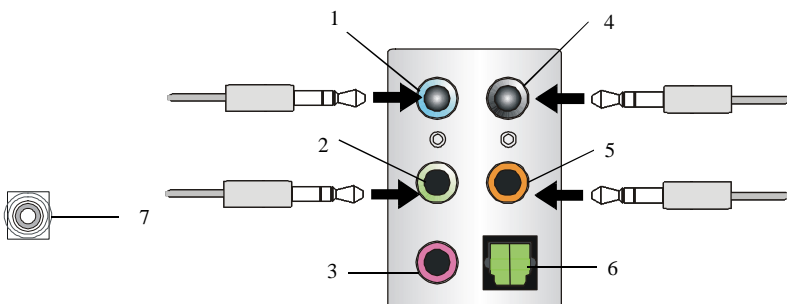
Description:

Connect two speakers to back panel's Line Out connector, two speakers to the rear-channel Line out connector and two speakers to the center/subwoofer-channel Line Out connector.

6-Channel Analog Audio Output

- 1 Line In
- 2 Line Out (*Front channels*)
- 3 MIC
- 4 Line Out (*Rear channels*)
- 5 Line Out (*Center and Subwoofer channel*)
- 6 S/PDIF Out-Optical
- 7 S/PDIF Out-Coaxial

n 8-Channel Mode for 8-Speaker Output



Description:

Connect two speakers to back panel's Line Out connector, two speakers to the rear-channel Line out connector, two speakers to the center/subwoofer-channel Line Out connector and two speakers to the side-channel Line Out connector.

8-Channel Analog Audio Output

- 1 Side Surround Out (*Side channels*)
- 2 Line Out (*Front channels*)
- 3 MIC
- 4 Line Out (*Rear channels*)
- 5 Line Out (*Center and Subwoofer channel*)
- 6 S/PDIF Out-Optical
- 7 S/PDIF Out-Coaxial